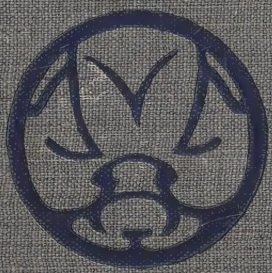
THE PRINCIPLES OF DESIGN



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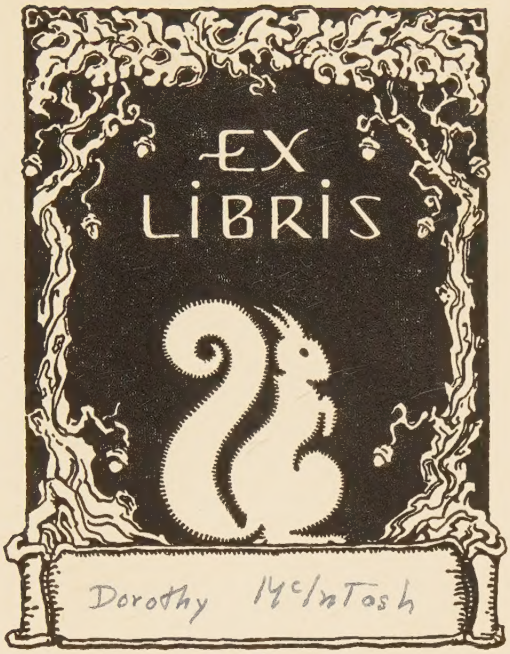

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THE PRINCIPLES OF DESIGN

BY

ERNEST A. BATCHELDER

INSTRUCTOR IN THE MANUAL ARTS THROOP POLYTECHNIC INSTITUTE ✦ PASADENA, CAL.

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PREFACE

THIS book represents a careful revision of a series of articles on "The Principles of Design" published in The Inland Printer. I do not lay claim to an originality of thought in the theory of design presented. Those who are familiar with the work done at Harvard University under the guidance of Dr. Denman W. Ross will recognize at once a development from his ideas. It was my privilege to be associated with Dr. Ross as instructor at the Harvard Summer School of Design in 1901. It is from this association that I date my present interest and enthusiasm in the theory and practice of design.

The subject of design has been treated by various writers from many points of view. We may learn of the historic development of design, of the anatomy and construction of patterns, of the conventionalization of natural forms, and of the application of designs. Many of these books are helpful and instructive, invaluable to the student. But oftentimes too much seems taken for granted. As a student, as one who wishes to express himself with simplicity and directness, who seeks a ground on which to build an individual judgment, the questions often arise, "Where shall I begin?" "What shall I do first?"

Good designs are dependent primarily upon the proper association and relation of lines and areas. The student's first step should be to acquire a clear

concept of the simple, underlying principles of line and area composition. It is with the hope of adequately defining these principles and at the same time of presenting a series of exercises leading from the simple to the complex, from the known to the unknown, that this book is published. Its purpose will have been fulfilled if it serves to awaken the student's interest, and induces him to exercise an individual observation and expression in the study of a broad, many-sided subject.

ERNEST A. BATCHELDER.

Throop Polytechnic Institute, Pasadena, Cal.

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CHAPTER I.

"The first condition in effective design is to know what we wish to do. To know what we wish to do is to have an idea; to express that idea we require principles and a form."

—Viollet-le-Duc.

HE aim of the work that follows may be briefly stated as an endeavor, first, to present a series of exercises that will define the fundamental principles of design; second, to induce an activity of imagination; third, to aid the student to express an idea in an orderly way in accordance with the principles as defined.

In any work involving the use of mind, eye, and hand, we must learn by doing, not by casual seeing or reading. The solution of a series of problems will present difficulties unforeseen in the reading. It is in overcoming these difficulties, each in its proper place, that we exercise skill and judgment, learn to think in an orderly way, and thus progress.

Those who desire to pursue the line of work to be given will find use for the following equipment, mental and material:

First —A fund of common sense! This is always

a prime consideration in a question of taste as well as in other affairs of life. Our instruction will lack the element of personal contact, hence, common sense must be the arbiter of many minor points. Directions will be as clear as possible; but even so, doubts will occasionally arise. When in doubt use common sense!

Second —A wholesome imagination! This is also an important factor, for all art — music, poetry, design, or what not — must spring from the "play impulse"; the effort must be free and spontaneous, not a matter of duty or drudgery, nor with the expectation of immediate pecuniary benefit. The solution to each problem must be a pleasure; otherwise little will be gained in the end. However, as one of our aims will be to stimulate the imagination, let us pass on, without further comment, to the material part of the equipment.

Third —A bottle of india-ink, black; a pan of charcoal-gray paint, water-color.

Fourth — Two or three water-color brushes, a small one, say No. 2, for lines, and a larger one, say No. 7, for washes. A bamboo Japanese brush will be found most useful for all general purposes, as it is suitable for either line or wash.

Fifth — A transparent paper that will "take paint." Japanese water-color paper is best. It may be purchased of a dealer in artists' materials or at a Japanese store. It need not cost over 1 cent per sheet. Ordinary typewriting paper will answer for most of the problems.

Sixth — One or two sheets of "squared-underlay," or engine-ruled paper. This paper may be

secured ruled into one-eighth-inch squares, one-fourth-inch squares, or one-half-inch squares. The one-fourth-inch ruling is best for our purpose. If the paper can not be readily obtained, you may, by the expenditure of a few moments' patience and care, do the ruling by hand.

Seventh — Drawing board, T-square, thumb-tacks, triangles — these things are useful, but even without them, most of the work may be done.

The designer is always confronted by a definite problem. Conditions are imposed by material, construction, process of manufacture, use, environment; but with an intimate knowledge of all these technical matters there must also be a keen appreciation of beauty in the abstract. A piece of work may be beyond criticism in its adaptability to the conditions just cited; yet it may, at the same time, be stupid and altogether unworthy from the point of view of beauty. As a design, whatever the material, a piece of work must be brought to the test of line and mass composition; failing here it fails as design.

Good designs are invariably sane, regular, orderly, consistent throughout. A piece of work well done brings to the beholder a sense of satisfaction, completeness; there is no desire to change a line or an area, or to vary any of the tone relations.

Given a sheet of paper, a brush, a bottle of ink, and a limitation of straight lines as a motif. Within these limitations completeness may be attained. As a work of art the result may be relatively unimportant ; but it may be beautiful for the same reason that the Parthenon is beautiful ;

because it is complete within its limitations. Beyond this no design can go.

If, with such simple means, a student may acquire sufficient understanding of the principles of design to apply them to an arrangement of lines, may he not gradually progress from this humble start to more complex, more important achievements, to a recognition of the principles of his art in the work of others, and to a sense of dissatisfaction when he finds those principles violated?

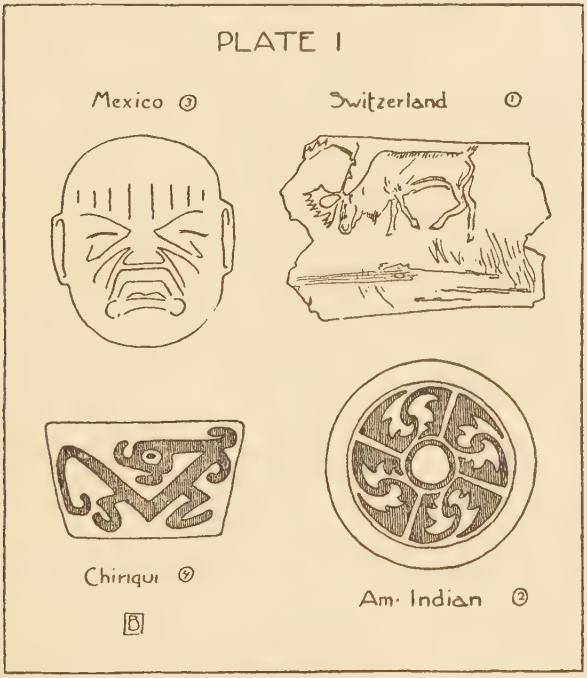
Let us come to a closer understanding of the line of work that is first to occupy our attention. For sake of simplicity we will revert for a moment to the beginnings of art. In the past there are periods known vaguely as "prehistoric times." The expression carries with it no sense of date; the prehistoric period of one nation may be contemporaneous with the highest development of another. Even now there are tribes living in the stone age. But there is no period of time that can be properly designated as preartistic, for indeed it is by artistic remains, rude to be sure, such as flint chippings, bone scratchings, and fragments of pottery, that anything is known of the lives of early men.

A study of prehistoric art shows a development along four distinct lines (Plate 1):

1. Representation, or the record of facts of observation. Many drawings have been found scratched on flat surfaces, presenting rude, though truthful, representations of animals, trees and other features. The example given is typical. It was a sketch, a record of observation, not intended to serve any decorative purpose.

2. Pure design, the arrangement of lines or masses in an orderly way for sake of their decorative value.

Here are the two extremes. Between these extremes let us consider two other lines of development:



3. Design in representation, an instance in which the element of representation dominates; but at the same time the arrangement of lines shows recognition of a decorative value. It is a record of observation told in terms of design.

4. Representation in design. In this case design has received first consideration, while representation is of secondary importance. We perceive a resemblance to some natural feature — presumably derived from an alligator — so abstract in character that we have little means of identification.

Examples might be multiplied from the work of various nations and periods showing the continued development of these lines of work. It is hoped that the student will supplement these illustrations by seeking others for himself.

We will devote ourselves first to the study of what has been called the pure design point of view. Pure design gives definition to fundamental principles and employs as a means to an end abstract spots of paint or ink. A spot of paint may be described in three words; it is a tone, a measure, a shape. This description applies to any spot of paint that can be made. We are to be guided by certain definite principles : rhythm, balance, harmony.

" Pure design is the composition of tones, measures, shapes, for the sake of rhythm, balance, harmony, the principles of order and beauty."

Tone means the value (as dark, light); or the color (as red, green, blue).

Measure means the size (as long, short, large, small).

Shape means the contour or bounding line (as straight, curved, square, round).

These terms are important. One term must not be confused with another. To emphasize the distinction let us insert here the first problem.

PROBLEM:

Make a spot of paint of any tone, measure, or shape you may choose. Place it preferably at the top of the sheet of paper and then, on the same sheet, repeat the spot, but with the following variations. When done, you will have eight spots, including the one with which you started.

First — Change its tone without changing its measure or shape.

Second — Change its measure without changing its tone or shape.

Third — Change its shape without changing its tone or measure.

Fourth — Change its tone and measure without changing its shape.

Fifth — Change its tone and shape without changing its measure.

Sixth — Change its measure and shape without changing its tone.

Seventh — Change its tone, measure and shape so as to obtain an entirely different spot of paint.

Note.—Pin the transparent paper over the squared paper. Do not use a ruled line in this or any problem that follows. Any one can make a ruled line; it has little artistic value and will not be serviceable in the development of judgment or taste. The lines of the underlay will be sufficient as a guide, supplemented by a light, free-hand pencil line. Allow one sheet of paper for each problem and consider always the arrangement on the sheet, and the neatness and accuracy of execution. Practice orderliness from the start.

With the solution of the problem given we are prepared for a definition of our principles.

Rhythm means joint action or movement, a consistent relation and connection of parts that enables the eye to find a way through all the details of a design.

Balance means repose that results from the opposition of attractions.

Harmony means the "consistency of likeness; having something in common." "A unity, all the terms of which are in interior accord." *

Thus we have as terms : tones, measures, shapes; principles : rhythm, balance, harmony ; problems : combinations of terms with principles in order to understand the various ways in which a principle of design may manifest itself.

It would be well to enumerate the more important manifestations of the principles of design.

Tone rhythm is a movement gained by tone gradation from light to dark, from color to color, from intense color to neutrality, or vice versa.

Tone balance is the result of a selection and arrangement of contrasts in such way that each part of a design may keep its proper place without being unduly emphasized at the expense of other parts.

Tone harmony occurs when tones sharing some common quality are used; or lacking this, the differences may be reconciled by varying the quantities of the tones used.

Measure rhythm is a movement gained by the gradation of measures, the regular increase or decrease in the measures of lines or areas.

* Hegel: "Philosophy of the Beautiful."

Measure balance is the careful adjustment of the various attractive forces in a composition in order to secure the same feeling of repose that is found in symmetry.

Measure harmony comes from the use of measures having some common unit of division; or again in the cutting of large measures in such way that they will keep their proper plane in the composition.

Shape rhythm is a movement gained by the regular repetition of a unique shape; or by the interrelation of lines or areas; or by a combination of both these expressions.

Shape balance is the opposition of equal attractions in symmetry on a vertical line or about a central point.

Shape harmony results from the use of shapes having some common character in lines or areas.

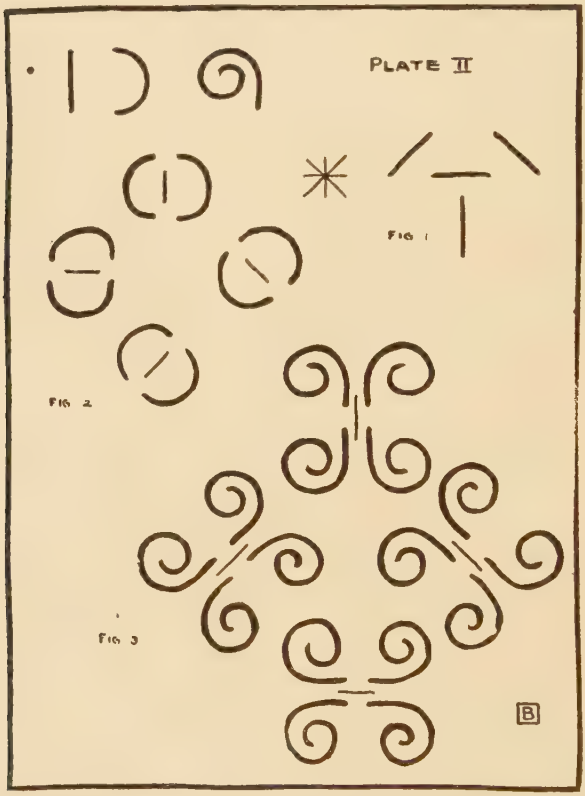
One or two or all of these manifestations may be found in a single design. Their presence counts for unity, their absence for discord.

The simplest spot of paint is the dot. The dot may be expanded into a line or into an area. The line is simpler than the area, so let us begin with that.

A line may be given any tone, measure, or shape that is desired. For sake of definiteness let us select from the endless variety of lines three typical shapes: the straight line, the arc, and the scroll (Plate II). To the straight line we will give four positions : vertical, horizontal, left oblique, and right oblique (45 degrees). The arc will have eight typical positions, the scroll sixteen.

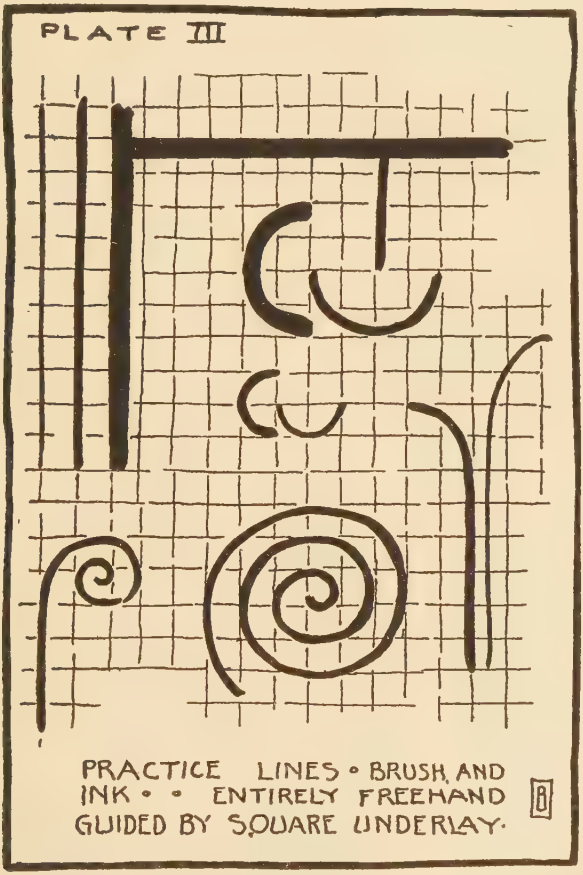
Note.—The lines in Plate II were made over the

squared paper; this gives them a common unit of measure, the quarter inch. Before attempting a similar sheet you will probably find a certain amount



of practice necessary; it is a difficult thing to make a pliant brush do your bidding. Try two or three sheets similar to Plate III. See if you can make with a brush, a straight line, an arc, a scroll, that will go just where you wish it to go and retain

throughout an approximately even width. If the line is to be firm and steady the brush must be held in a vertical position. Press it firmly down until the

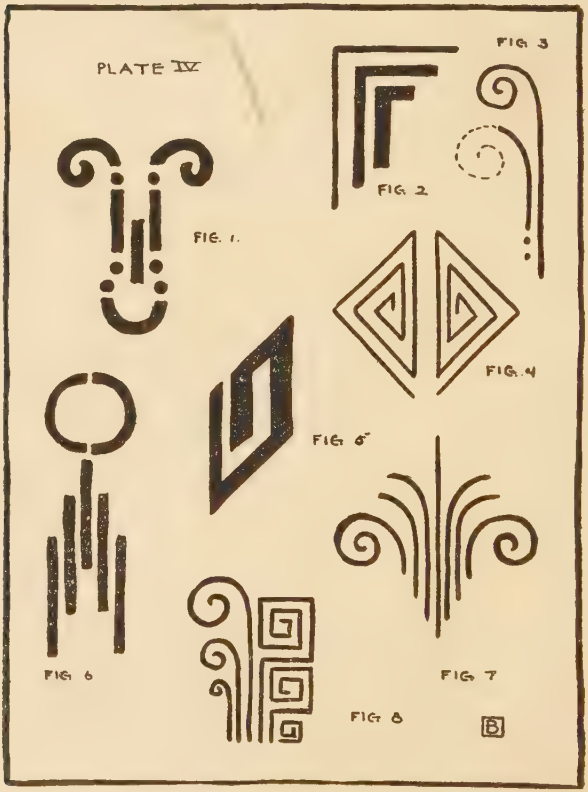


desired width is gained, then with the little finger as a gauge, drag the brush slowly and carefully after

the hand. A good line will require the concentration of all your faculties in its execution. When you can make such a line the first difficulty has been overcome.

PROBLEM:

Make one, or two, or as many sheets as you wish, similar (not copies) to Plate IV, to contain various



groupings of the shapes and positions given in Plate II. To exercise your invention try lines of the same shape but of different measures; lines of the same measure, but of different shapes.

With the solution of these preliminary problems we are prepared for a study of the principles and the relation of the terms to the principles.

CHAPTER II.

"In all association of lines whatsoever, it is desirable that there should be a reciprocal relation, and the eye is unhappy without perception of it."—John Ruskin.

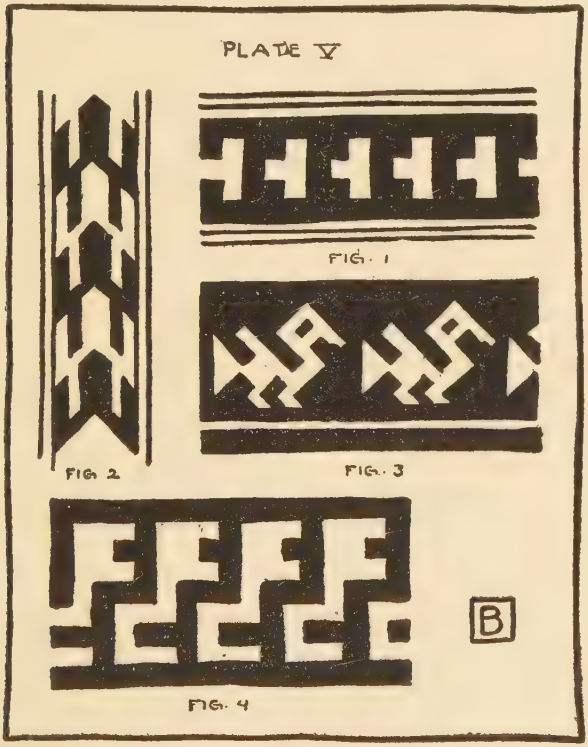
RHYTHM means joint action or movement. Emerson tells us that "motion, or change, and identity, or rest, are the first and second secrets of nature; ***. The whirling bubble on the surface of the brook admits us to the secret of the mechanics of the sky. Every shell on the beach is a key to it. A little water made to rotate in a cup explains the formation of the simpler shells; the addition of matter from year to year arrives at last to the most complex form."

Who does not recall the lazy, hazy rhythm of a hot summer's day in the country? — when waves of heat throb over the hill sides; when the air is filled with the drowsy hum of insects. Note the drum of the partridge in the woods, the z-zing of locusts down in the grass. Note the growth of flowers and trees, as in the tall Lombardy poplar, where all the limbs persist in a joint upward movement; or in some old tree on a hill top exposed to the prevailing winds.

SHAPE RHYTHM

The simplest manifestation of rhythm in design is shape rhythm. Let us call attention to two varieties of shape rhythm:

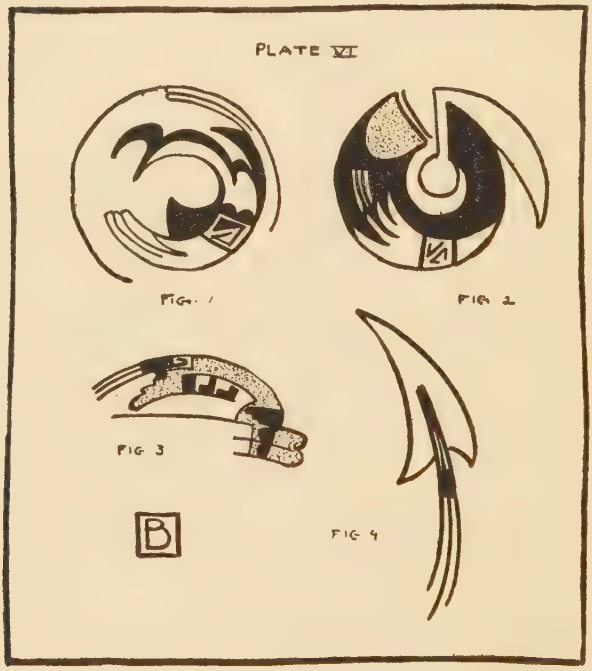
1. Rhythm may be gained by the regular repetition of a shape. The dot for example, would require repetition at regular intervals to gain joint action.



Note the beating of a horse's hoofs on the pavement. Variety may be added to this, as in the beating of a drum, or the recurrence of a sound in music or

poetry; but with all the variety the regularity must be retained. When the cat walks on the piano there is a succession of sounds, but no music. Puss has never learned to keep time.

2. Rhythm may be gained by the interrelation



of lines without the necessity of repetition. Note the upward coil of smoke from the chimney; the reflection of lights in the water. The scroll, partly from its shape connections, leads the eye in one consistent movement.

If we wish to accent the rhythm in a design we

PLATE VII

may combine the two movements — take a rhythmic shape and repeat it at regular intervals.

Plate V shows examples of the first type of rhythm. The joint action comes chiefly from the regular repetition of a unique shape.

Plates VI, VII, VIII show examples of the second type. Here the relation of lines and areas gives the movement. Note how easily you glide from one detail to another; each line seems to have a continuation in some other part of the composition.

The Indians give motion, vigorous, unmistakable motion, as the dominant feature in design. Their work invariably strikes a fresh, inspiring note unfettered by academic influence. The play impulse is there; the motive is to say something, to express an idea, and this is done in a frank, straightforward way. There are many valuable lessons to be gained from a study of Indian work. "It offers the best possible facilities for the study of the fundamental principles of esthetic development." *

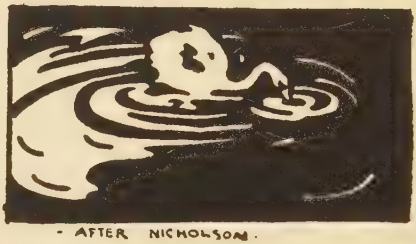
Rhythm is also a noticeable feature of Japanese art; but here we recognize a higher intellectual force at work. In Plate VII there is rhythm of the highest order. The vigorous swirl of the Indian gives place to a movement more refined, more subtle, governed by the repose and the harmony that results from a sensitive feeling for higher laws to which the Indian designer has not attained.

PROBLEM:

Plan a border in which rhythm is to be gained by the regular repetition of lines. Plates IX, X will

* William Henry Holmes: "The Textile Art."

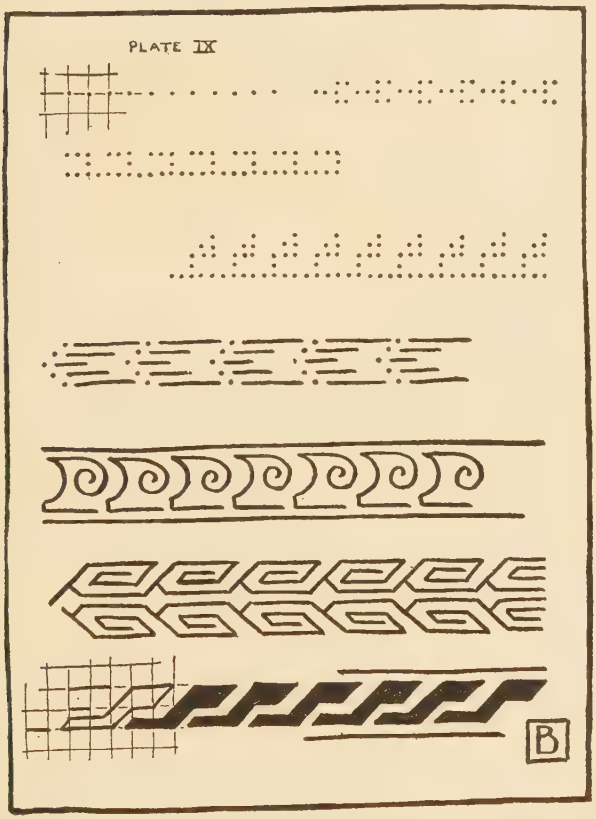
PLATE VIII



- AFTER NICHOLSON.

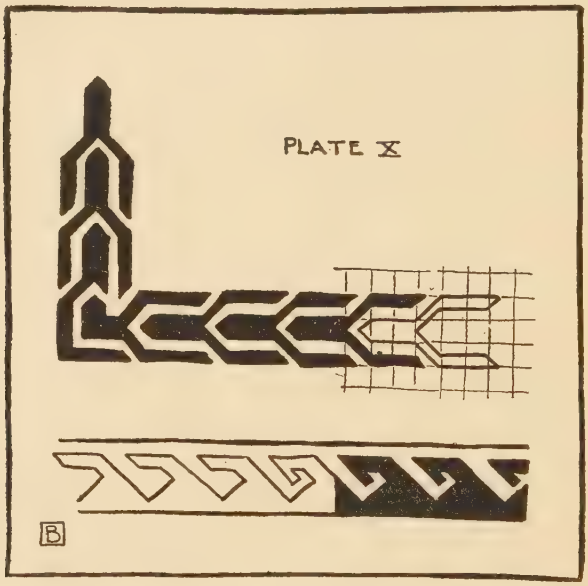
B

explain what is desired better than words. Use only such terms as were given in Plate II, though you are at liberty to vary the measures of those lines,



either as to length or breadth. Pin your paper over the squared underlay. Do not make too pretentious an effort at the start. Note the infinite possibilities of the straight line alone.

The problem is not to make as many borders as you can. Try one and work at it until it gives a sense of satisfaction, completeness. Simplify it! Are there too many attractions involved? Is there an unnecessary line? A finished and satisfactory design should never suggest the question "Can I



remove this feature?" or "Is that line necessary?" There should be no question about the importance of each line involved. Unrelated elements should not be allowed to clamor for individual attention.

After you have tried a border of lines alone, try to combine lines into areas, as in Plate X. Watch the proportion of black to white, and remember that the white in a design is just as important as the black.

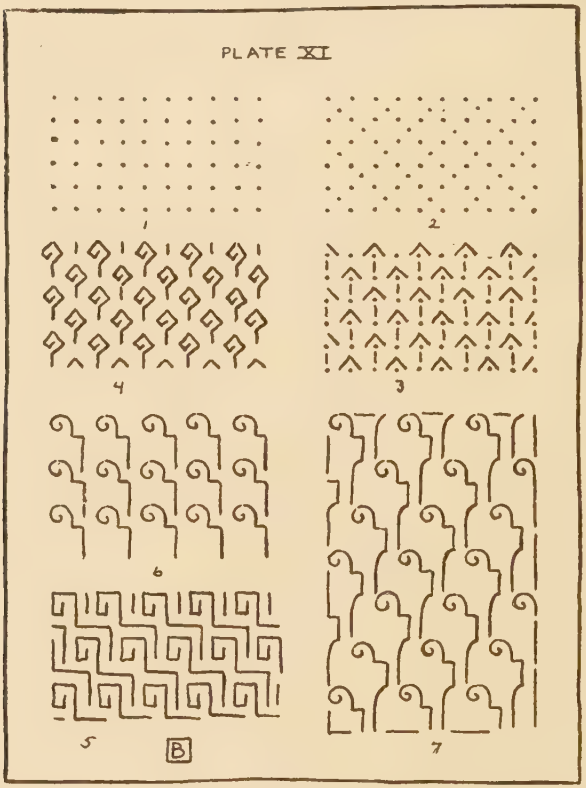
It seems best to enter a plea for simplicity before continuing this problem, for at times disquieting dreams arise at the thought of some reader turning and twisting those unpretentious lines into all manner of strange gyrations, mistaking that for originality. Puritanic simplicity in design is preferable to a specious originality that always strains to do something unusual. Continued effort along this line may lead to superficial cleverness, something from which every designer should pray to be delivered, and from which deliverance is possible only by a constant recurrence to standards of simplicity. We might almost define "style" as direct, straightforward simplicity. You are experimenting; these exercises are to make you think. Your lines may be crude and uncertain in character, but if the results bear evidence that your mind and hand worked together in making them, and not your hand alone, the result sought will have been gained.

Please do not depart from the paths of order and regularity. Whatever beauty there may be peculiar to designs of the type now shown, it must necessarily come from a clear, simple construction. An orderly construction alone will bring value to the result. No amount of elaboration will avail unless your construction is sound at the start. The most interesting results will be the simple ones in which there is an obvious interrelation of parts.

PROBLEM:

Develop a line rhythm over a surface. Plate XI, Fig. 1, shows the application of the dot to a surface. When the dot is repeated at regular intervals there is no difficulty in finding a way through the design;

but the result is monotonous, mechanical, lacking in personality. The first slight change, as in Fig. 2, gives at once an additional interest, though the regularity still remains. In Fig. 3 another step has



been taken; direction has been given to the movement. If we simplify this, as in Fig. 4, an improvement is noticeable. There are fewer elements involved, and there is a better relation of black to

white; they are working in unison. Can you improve Fig. 4 by adding any line, or by taking anything away? If not, the design is complete, perfect within the limitations imposed. Something "original" has been produced; a design has been thought out, understandingly, from beginning to end.

Now, having arrived at Fig. 4, let us not abandon this motif and seek a new one. More will be gained by experimenting with this result in an effort to develop a new arrangement. Fig. 4 may suggest another idea that will lead to such an expression as Fig. 5; and this, in turn, may lead to Fig. 6, and still further to Fig. 7. Compare this last result with the one with which we started. There seems to be little relation between them, and yet, by the exercise of study, of invention, one has been developed from the other. This development might continue as in Plate XII, each result suggesting a new idea. It is the idea that must come first in design. If you have no idea you will never make a design. You may resort to parrot-like imitation or "adaptation," of things that others have done, but, parrot-like again, you will very likely present an outward form robbed of all its consistency and significance.

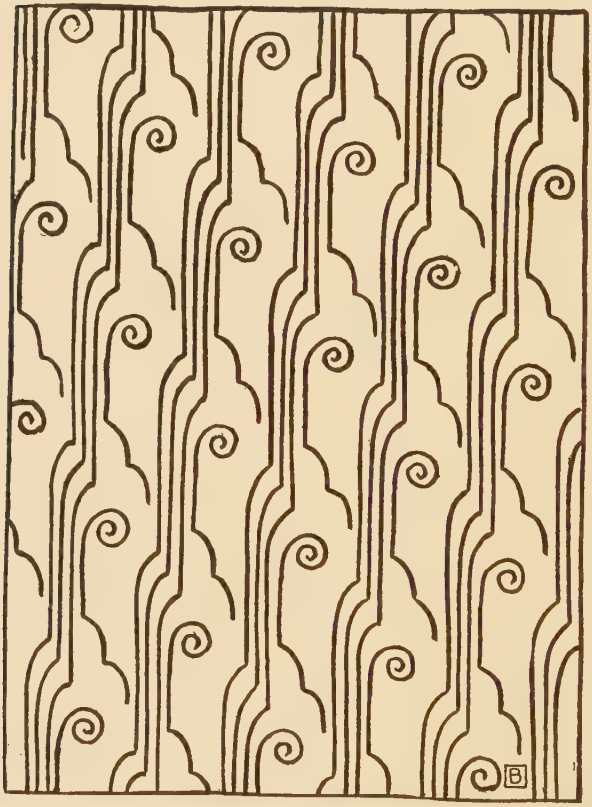
In connection with this work let us begin the consideration of the next principle, balance, in so far as it is related to the term shape.

Shape balance in design may be defined as symmetry, a design, or figure, or unit, in which the shapes on one side are opposed by corresponding shapes on the other side. This opposition of shapes gives the simplest type of balance ; the eye naturally seeks the center. No difficulty will be experi-

enced in finding examples of shape balance in the work of all nations and periods.

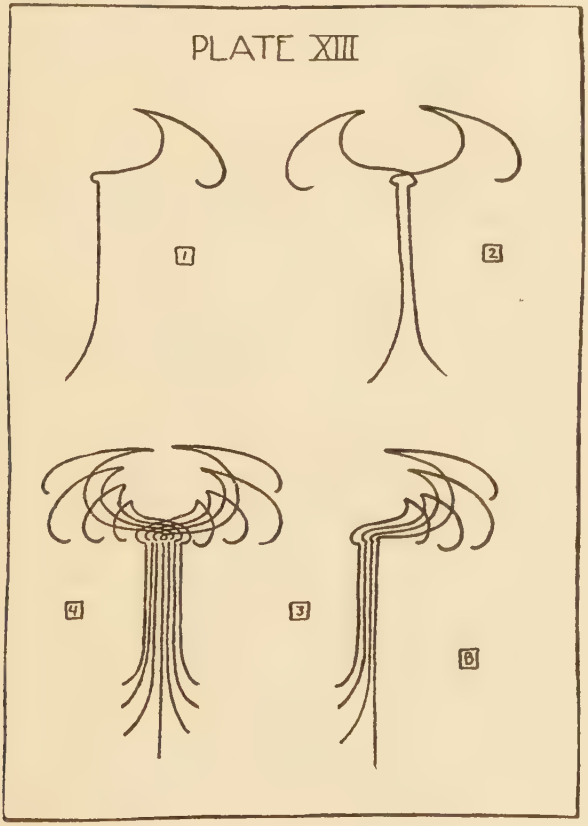
A formal symmetry is so readily obtained, and the opposition even of purely accidental lines often

PLATE XII



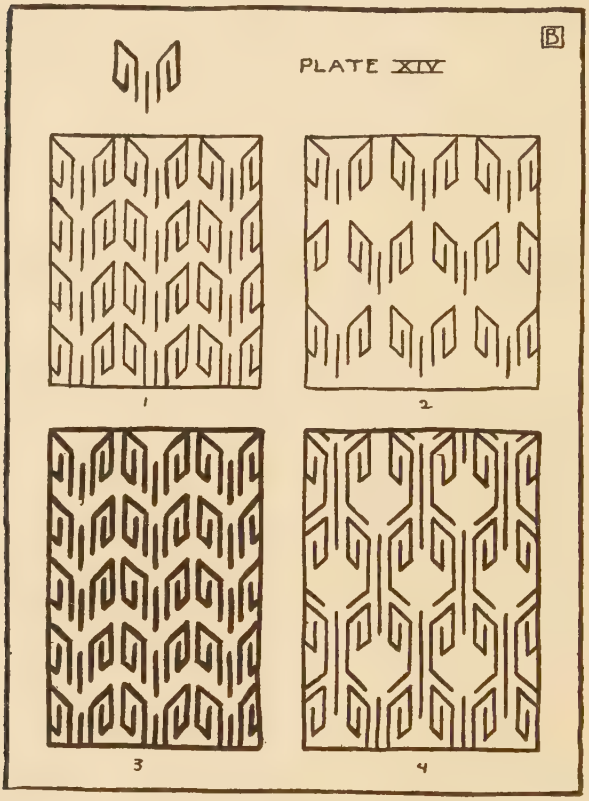
results in such unexpected charm, that the student sometimes resorts to symmetry without sufficiently considering its limitations. Let us take a line made

almost at random, as in Plate XIII, Fig. 1. By opposing this line in a balanced arrangement, an interesting result is obtained. Continued experiment with



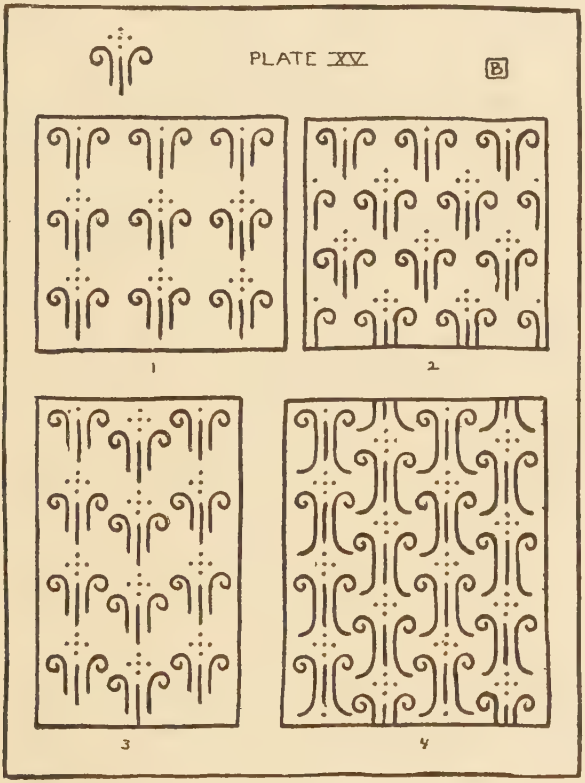
the motif might lead to Fig. 3, and another opposition to Fig. 4. This process, when confined to abstract lines and areas, is commendable and often succeeds in stirring latent ideas. But symmetry

should obey natural laws. The closer we come to nature the more careful we should be to avoid a complete symmetry; it is best left to formal geomet-



ric lines and areas. Complete symmetry in nature is found in crystals, shells, etc. In leaves, flowers, plants, insects, animals, it becomes less and less apparent as we ascend the scale. To be sure, it still

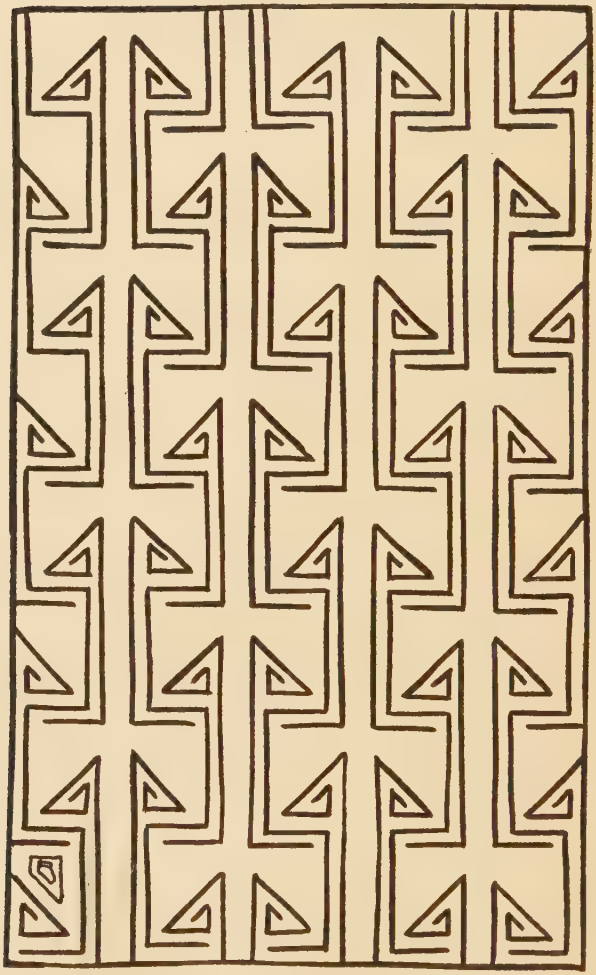
remains as the essential basis of construction in the human figure; but while the higher types of nature seek a balance, it is seldom indeed that they are in a position illustrating formal symmetry. Symmetry is present but subordinated to higher qualities.



PROBLEM:

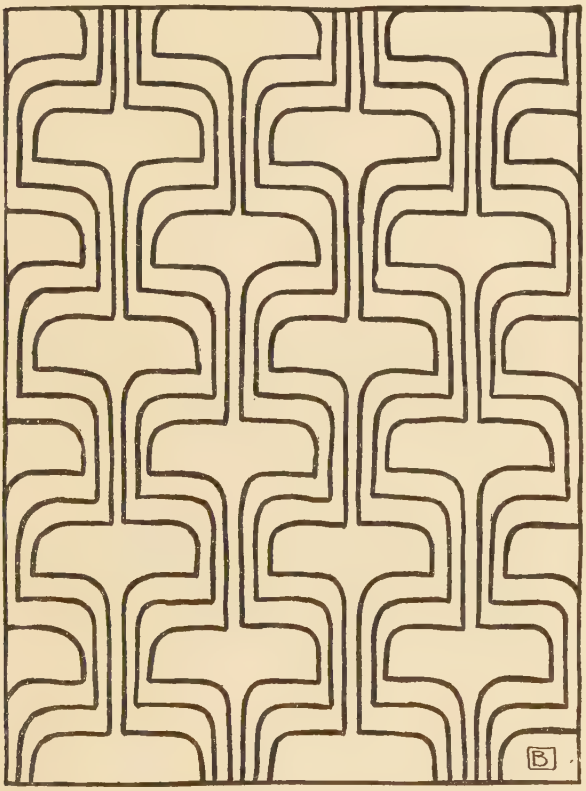
Take one or two simple elements from Plate II and combine them in such way that a shape balance

PLATE ~~XVI~~



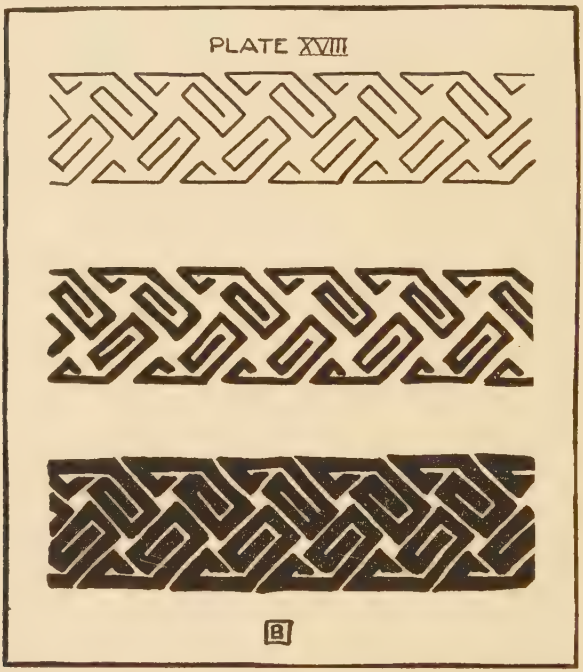
will result, as in Plates XIV, XV. Use the squared paper as in previous work, and relate the lines so as to secure rhythm as well as balance. Take the

PLATE XVII



unit thus made and develop it over a surface as in Plates XIV, XV, XVI, XVII. Experiment with each unit in order to find how it can be repeated so as to give the best relation of lines. To merely make a

unit and repeat it over a surface is a stupid process. The unit is only the starting point in the construction of a pattern. To gain a satisfactory line movement it may be necessary to change the original unit; a line may be added or a line may be taken away. In making such a change, though, be sure that you



have a definite purpose in mind. For instance, in Plate XIV, Fig. 2, there seems to be a lack of strength; the whites are scattered and the relation of the black lines is not of the best. In Fig. 4 a slight change has been made in the unit to remedy the trouble, and the result is more satisfactory.

The movement is better, the whites are more distinctly defined and the design as a whole has more substance.

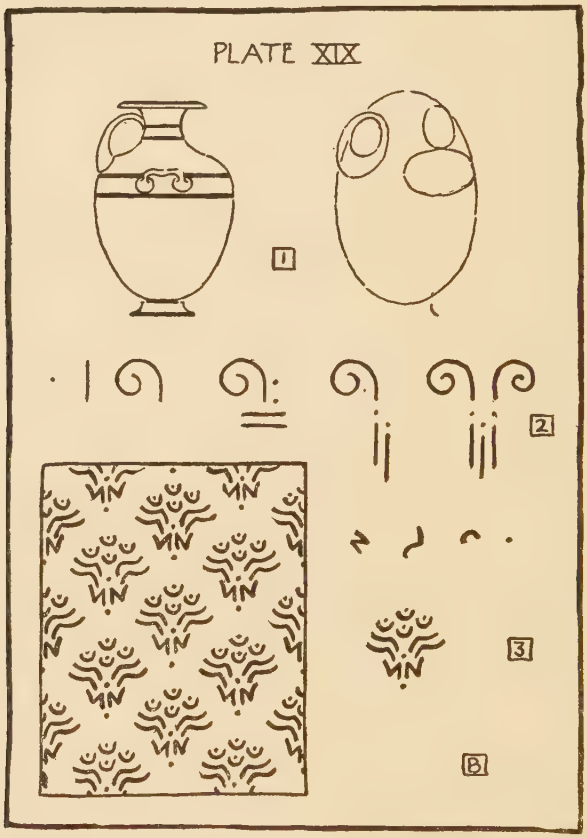
Our work has been limited to black ink on white paper; but, even so, we are by no means limited to those extremes of contrast. Each design, as a whole, presents a result that is neither black nor white, just as in printing there may be found every variety of tone, from the rich, dark page of the Mazarin Bible of Gutenberg, to the lighter contrasts of modern work. Compare a William Morris book with the page of a current magazine. Thus in Plate XI no two of the designs have the same tone. Fig. 1 is the lightest; Figs. 4, 5 are the darkest.

A glance at Plate XVIII shows that the tone of the design will vary according to the increase of measures, either of black or white. An increase of black measures gives a dark tone to the whole; an increase of white measures lightens the tone.

This question should receive careful consideration. Having secured a good construction, the next important matter is the choice of the best line measure in which to render the result. Which tone shall dominate, black or white? Or will it be best to strike a balance between the two? Experiment for yourself; each design demands an answer on its own merits.

Harmony requires that the details of a design shall have "something in common." Shape harmony would imply that all the shapes in a piece of work must share some common property. For example, curves and curvilinear figures would go well together; straight lines and rectangular figures would be clas-

sified in the same way. Thus if we would have complete shape harmony we would see that all the figures in a design were similar, or at least governed by the



same law. To illustrate this idea of shape harmony examine the Greek vase shown in Plate XIX. Here we may recognize certain qualities somewhat foreign

to many productions of the present day. Among other desirable features it is plain that the designer of that form sought a complete harmony of shapes. He chose as an underlying form the ellipsoid, governed by the curve of the ellipse, and made the other curves in his vase a repetition of the first one, merely changing the measures. This gives a consistent whole, a design that pleases the eye because we are able to grasp the main features without confusion.

Here we are confronted by another proposition. It is not always possible to use shapes that are similar in character; often the designer is forced to do the best he can with unrelated shapes; he may prefer to use shapes that have nothing in common. Even so, harmony need not be sacrificed; it becomes necessary "to reconcile the differences" of the various shapes employed. Here we show our skill as designers. The dot, the straight line, and the scroll have little in common, as shown in the first example, Plate XIX. In the second case they have still less in common, for here the arrangement serves to make the differences more apparent than before. In the third instance, though, the terms have been placed in such relation that they share a common movement or rhythm; the differences of shape are so reconciled that the eye finds no difficulty in grasping them as a whole. "The pleasure in harmony consists in its shunning differences too rude and oppositions too startling, for the accord must be more apparent than the difference, and never, or but momentarily, be lost sight of."* In the fourth example the shapes have been balanced and the repose thus gained serves to make the accord still more apparent.

* Hegel: "Philosophy of the Beautiful."

In Fig. 3 certain shapes are shown that were made entirely at random, without thought of harmony or of the possibility of making a design. Given such awkward material, how can even a passable design be made? The first step would be to obviate the lack of harmony by placing the terms in such relation that they shall have a rhythm in common; then, by balancing them, the awkwardness of the situation is still further relieved; and last of all, by repeating this result, with studious regard for the relation of black and white, a conclusion is gained that, all things considered, is fairly pleasing. Similar use might be made of any atoms that chance to be at hand. It is not the wealth of available material —leaves, flowers, animals, etc.—that produces a good design. It is the man behind the material, and his grasp of fundamental principles that distinguishes good, tasteful work from mediocrity. The artistic printer is not the one who requires the entire stock of a typefoundry with which to work; nor the one who pins his faith to the ornamental stock-cut. These things will not take the place of a discriminating good taste. The longer a designer works, the closer he comes to a realization that success is quite dependent upon knowing what to leave out of a piece of work.

One more word, a definite application of shape harmony, and we will proceed to the next problem. Plate XX, Fig. 1, is an example of paneling traced from a book that makes pretensions of an artistic nature. Here there is harmony of shapes; but what conceivable reason can be advanced for placing the upper panel in such position that it has no relation,

no rhythmic connection with its neighbor? This is not an uncommon practice; it arises from an effort to be original, unique, with a mistaken notion that irregularity will bring the desired result.

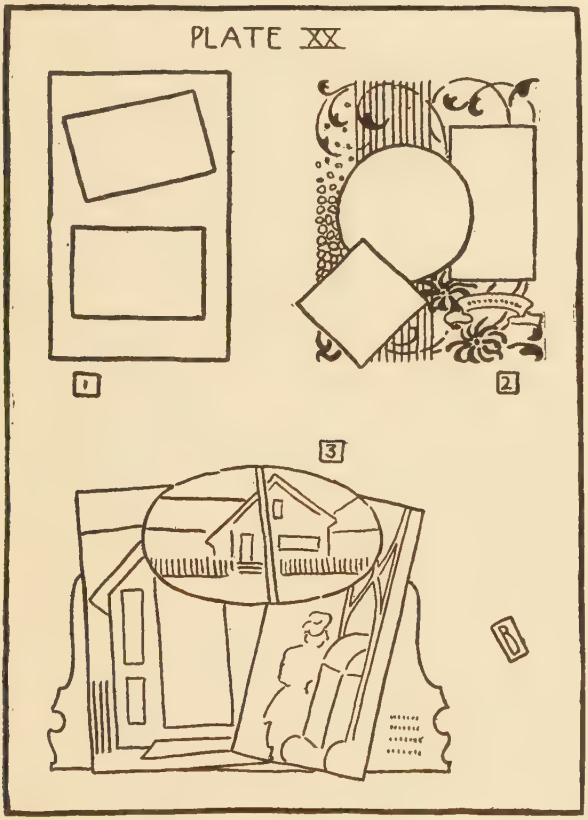


Fig. 2 is a still more common example of this sort of work. Here we have shapes that have nothing in common; but instead of trying to smooth this

unpleasantness, it has been emphasized by crowding the shapes together in a way that reminds one of a strenuous effort to drive square pegs into round holes. Furthermore, in the background is an assortment of curves and lines entirely unrelated to the shapes themselves. Compare Fig. 2 with the Greek vase. Surely the comparison requires no further comment. Fig. 3 is shown as an extreme case of this sort of thing. No better instance could be found in which there is such a complete lack of the essentials of good design as in this case. It has neither rhythm, balance, nor harmony; it is not sane, nor orderly, nor conformable to any discoverable law. It is almost beyond belief that any person would deliberately place pictures in such way as to bring the lines into the relation shown. It must have resulted from one of two causes — a desire to be artistic, but with ignorance of what constitutes good design, or an intention to be unique, regardless of good design. Let us hope that it proceeded from the former cause.

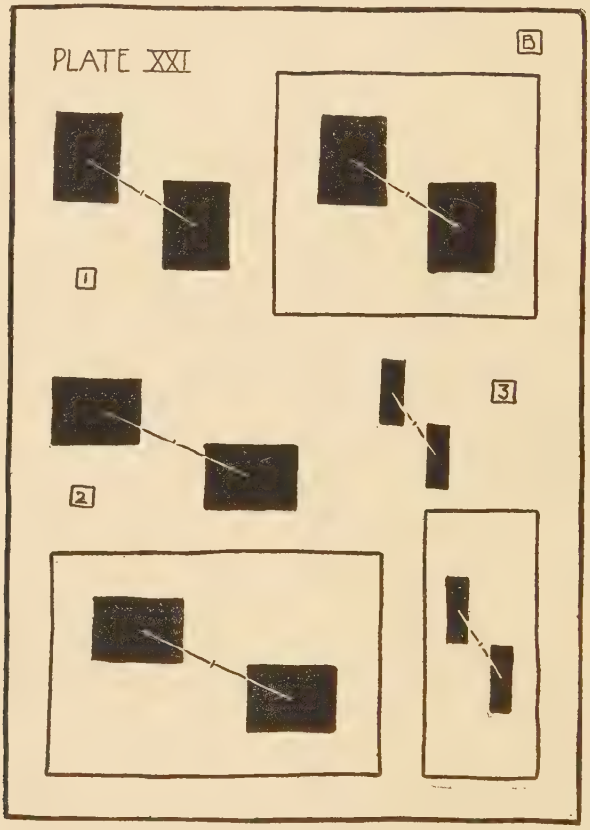
CHAPTER III.

"We ascribe Beauty to that which is simple; which has no superfluous parts; which exactly answers its end; which is related to all things; which is the mean of many extremes. Things may be pretty, rich, graceful, handsome, and still lack Beauty."—G. Baldwin Brown.

MEASURE balance brings to unequal forces the same feeling of repose that is found in symmetry; the eye finds repose at the center of equilibrium. Note the growth of trees. If left alone they will strive for a balance, though seldom for symmetry. The American gardener admires symmetry and conscientiously prunes his trees accordingly. The Oriental gardener recognizes Nature's higher law and aids her to attain the type of balance for which she strives. It is important that the designer should thoroughly understand this last type of balance.

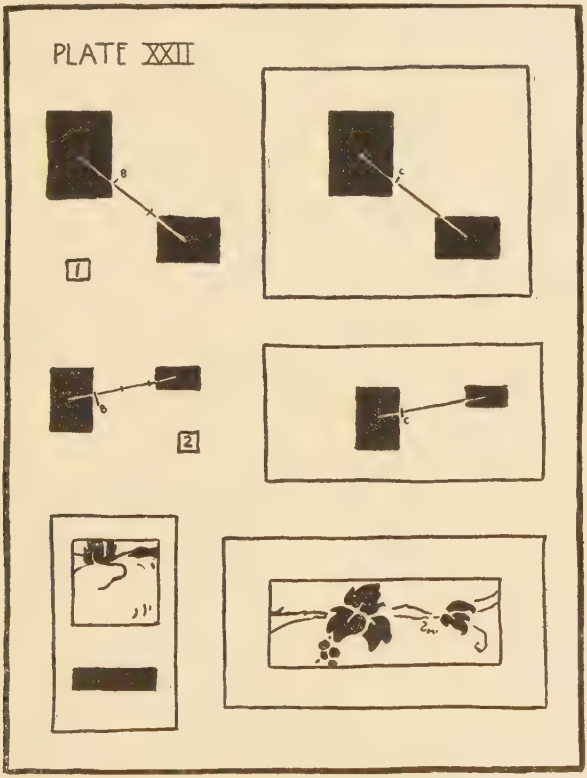
By measure we refer to size, the quantity of space contained within the limits of a given shape. Plate XXI, Fig. 1, represents two measures of black. Supposing we wish to place these two measures within a space so that they will be properly balanced. The problem is much as if there were two men of equal size on a "see-saw." The spots are to the eye

precisely like physical forces in nature, at least in so far as this law of balance applies. Let us draw a line connecting the centers of the measures. It is



evident that the point of balance will be in the middle of this line, for the measures exert equal attractions. Now, if we wish to place these spots within an enclosing form, this law of balance requires

that the point of balance of the measures shall coincide with the center of the frame. Mark that, for it is important. The eye naturally seeks the center of such a frame; it also seeks the point of balance



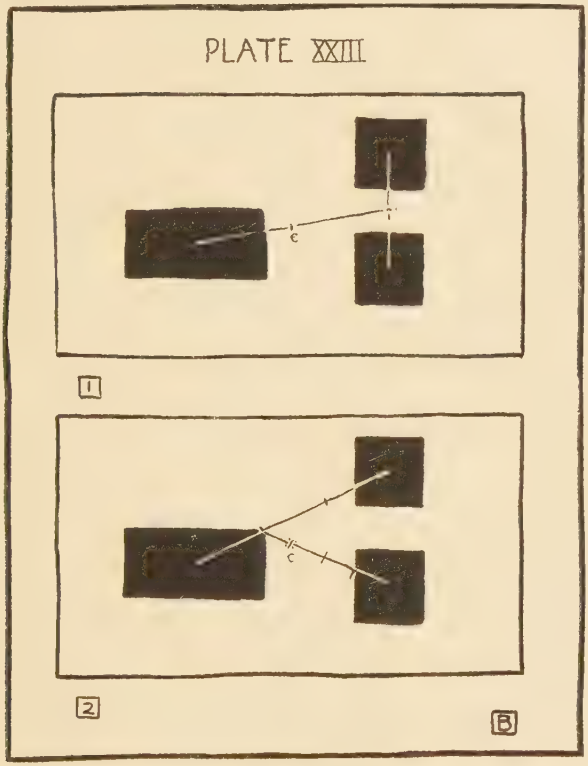
half way between the two measures, hence we should see that the center of the one coincides with the balance point of the others. Figs. 2, 3 illustrate the same problem, the shape of the enclosing form

being changed in each case so as to be in harmony with the shapes of the spots.

Supposing our measures are unequal; what then? In Plate XXII are measures of black that exert unequal attractions. They may be likened to a man and a boy on a "see-saw," the man weighing twice as much as the boy. Note carefully the steps taken to find the point of balance in this instance. We will draw a line connecting the centers of the spots, as before; but it is plain that the balance point can not be in the middle of that line. If the man weighs twice as much as the boy, it would be necessary to give the boy two parts of the board and the man one. Just so with spots of paint. As these spots have a ratio of two to one, the smaller spot must be given two parts of the line, the larger spot one part. This point of balance must now be the center of our frame, as before. Fig. 2 illustrates the same point, except that the smaller spot is only one-third of the larger, requiring a division of the line into four equal parts, three for the boy, one for the man.

In Plate XXIII the same process is applied to three spots. We will balance two of the spots first, and then balance these two with the third. Let us begin with the smaller measures (Fig. 1), for they are equal; their point of balance will be half way between centers. Then draw a line from the point thus found to the center of the remaining spot. The three spots will balance somewhere on that line. Where? As the two small measures equal the large one, the point will be in the center of the line. Having found this point, we can proceed as before and make it the center of the enclosing form.

To prove the truth of this demonstration, Fig. 2 shows the same problem done in another way. Here the large spot is balanced first with one of the small



ones, as in Plate XXII, Fig. 1. When this point is found, these two measures are balanced with the remaining small one. Here the ratio of size is three to one, so the small spot requires three parts of the line, while the other two spots need but one part. The result is precisely the same as in the case above.

It has been asserted that whites are as important as blacks. Supposing you employ the process just used and balance the white spaces in each of the problems given. If you can do this, you will discover that the white spaces will balance on the same point as the black ones, at the center of the frame.

In an application of this law of balance it may become desirable, at times, to correct a familiar optical illusion. In a vertical arrangement like Fig. 3, Plate XXI, there may seem to be a need for greater space at the bottom of the composition, even though the balance is mathematically correct. The type designers, for instance, have recognized this fact and in such letters as **B, H, S, E,** the lower part of the letter is often given more space than the upper part for sake of stability.

PROBLEM:

Balance two equal measures of black within a rectangle that will give harmonious shape relations.

Balance two measures having a ratio of three to one.

Balance two measures having a ratio of three to two.

Balance three measures of equal size.

Balance three measures in which there are two large ones of equal size and a small one just half the size of one of the large ones.

This law of balance, in so far as we have gone, may be concisely stated as follows:

"Equal measures of equal contrasts will balance at a point midway on a line connecting the centers of the measures."

"Unequal measures of equal contrasts will balance on a line connecting the centers of the measures at distances that will be in inverse ratio to the measures."

A solution of the problems will prove the truth of both these statements. Note the fact that the contrasts must be equal, or in other words the measures must all be of one tone : black, white, or gray, etc. To balance measures in which the contrasts are not the same will require consideration in a later chapter.

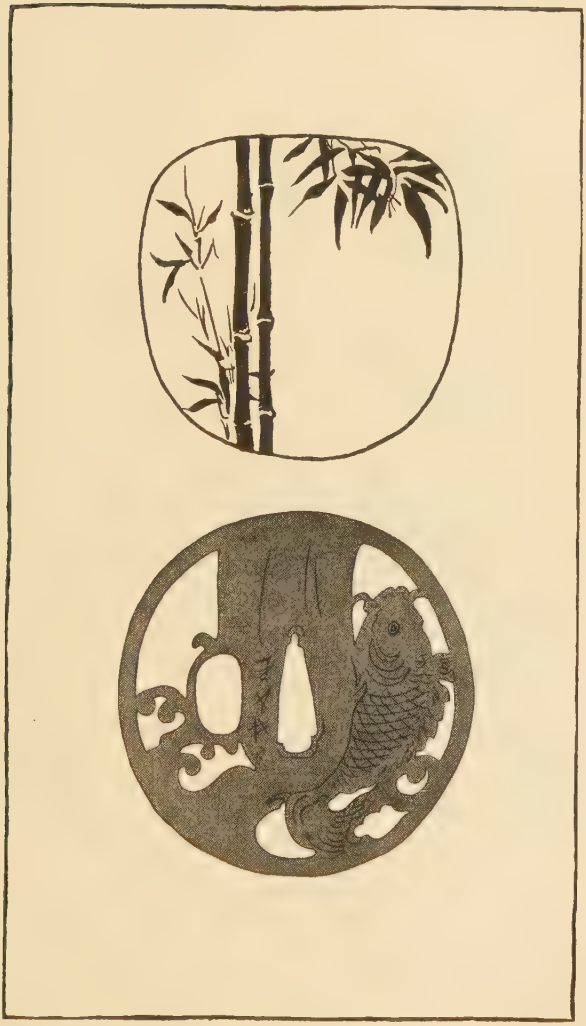
Objections may be raised that all of this is very much like mathematics and geometry, quite foreign to the art of designing. Mathematical it certainly is, and purely geometric in character, as has been all of the work thus far. It is well for a student of design to grasp this side of his art before gaining any mistaken idea that the designer is a person governed only by artistic feeling or impulse. The serious student of design discovers sooner or later that his expression of an idea must conform to the requirements of mathematics and geometry. There are innumerable limitations that forbid the freedom of expression granted to the painter or the illustrator. The beginnings in design of all nations have invariably been geometric in character, simple arrangements of lines, and the development of the art has been apparent only when the principles underlying these geometric arrangements have been thoroughly mastered. The art of printing, even more than many other arts, is dependent upon mathematics and geometry for effective design — spacing, proportion, counting, proper balancing of areas, subdivision of spaces, etc.

A study of Indian art shows that the essentials of consistent design are more noticeable in the baskets and blankets than in the pottery. The splints of the baskets and the warp and woof of the blankets compelled a careful consideration of geometry, of spacing and counting. The pottery designs bear evidence of a development from basketry, and as long as the pottery designs partake of a geometric character similar to the basketry, the work has a decided esthetic interest; but when the potter ignores his geometry and allows himself greater freedom of expression, his work lessens in value to the student of design. The Indian has not acquired sufficient grasp on the principles of his art to allow his imagination to express itself unrestricted by the limitations of geometry.

Japanese art, on the other hand, to the casual observer, contains very little of geometry; but the student of the art of Japan knows that the work of that country rests just as firmly upon the fundamental principles of design as the work of any nation or period. With all their fertility of invention the Japanese, in their best work, seldom violate an essential principle of design. For balancing of measures and tones, for rhythmic relation of lines and masses the student will find no end of inspiring material.

Note the subtle charm of the work in Plate XXIV. He must be dull indeed who fails to catch the exquisite grace of line, the perfect balance of measures and the harmony of shapes. Yet there are those who profess to find little of lasting value in the art of Japan.

PLATE XXIV



Examples of balance might be multiplied. Master the underlying thought as demonstrated and you will find no end of examples for yourself. In Plate XXV, Figs. 1, 2, are two pieces of Greek sculpture

translated into black and white for sake of comparison with Fig. 3, an illustration from a Japanese book. Note that in the first two instances we have the same balancing of measures as in the third instance.

Plate XXIX shows the application of the law to a pictorial composition. Find the center of the picture and apply the law for the balancing of unequal forces. Contrary to the notions of many, the task of the painter is not to place upon canvas just what is before him. His first object is to "spot" his picture, to look after its composition, the cutting of spaces, the balancing of attractions. Again, in photography the same thought may be found. "Artistic photography" once consisted in posing some young lady in Greek costume beside a vase and labeling the result "Meditation" or "Waiting" or some other equally meaningless name. Now the student of photography knows that his art does not rest upon any such unworthy basis. His work has esthetic value according to his selection of such a point of view, whatever the subject, that his pictures will show an appreciation of good spacing, beauty of line and a well-balanced arrangement of lights and darks.

Beautiful designs have undoubtedly been made by those who would be at a loss to define the law of balance or who have never solved problems of the kind you are asked to solve. They are the persons who have the same intuition for good design that the artist has for color harmony, or who possess that undefinable something known as good taste. But for every worthy thing done by those men numbers of feeble, immature productions are cast forth into the world by others who lack the intuition on the one hand and who have no conception of principles on the other.

MEASURE BALANCE

PROBLEM:

In Plate XXVI are some meaningless, abstract spots. They are unrelated and apparently hopeless

as material for design. Let us experiment with them. You will find that with a bit of tracing paper it is possible to rearrange the spots into units that

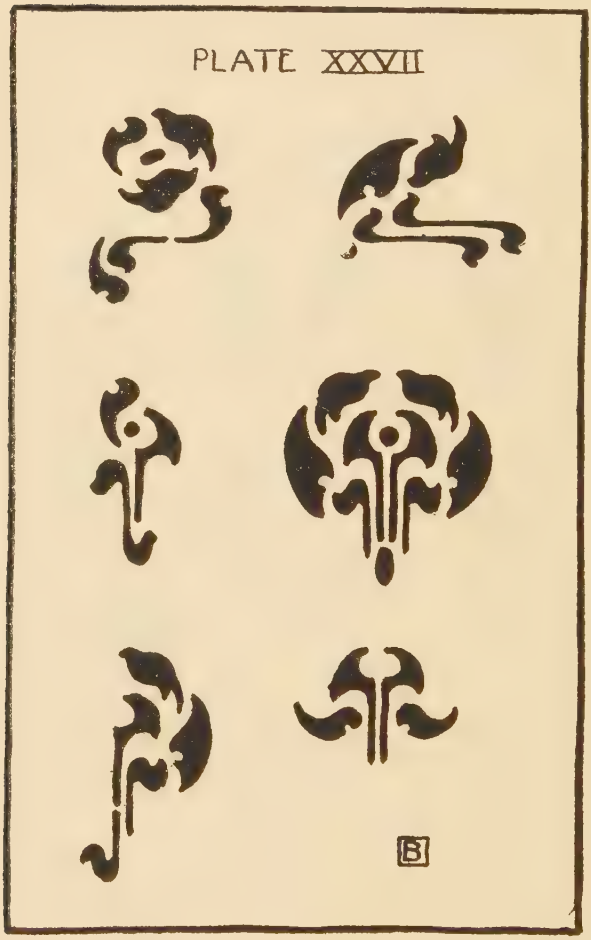


PLATE XXVII

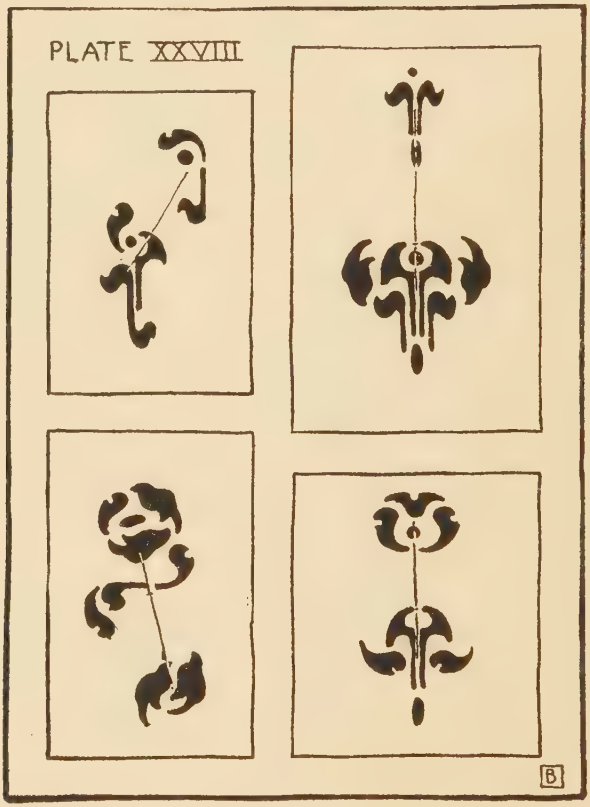
are decidedly pleasing to the eye. It is necessary first to place them in rhythmic relation, with studied care for grace and beauty of line. Plate XXVII shows a few examples of what can be done in this way. Here each spot, instead of asserting its own independence and disregard for its neighbors, has been so placed that it works in unison with its neighbors and becomes a part of a whole. To be frank, the problem is merely a reappearance in a new coat of our first attempt at rhythm, the difference being that areas are now given instead of lines; the idea remains the same. The spots are to be composed in such way that there will be an interrelation of parts. Take care that your eye is able to move with ease through all the details of each unit. There is no limit to the number of times a spot may be used in a unit, the only restriction being that no change is to be made in the shape of a spot, and that each spot is to be kept separate from its neighbor. The first efforts will be uninteresting; but as you become more familiar with the material, endless possibilities will be discovered.

When several pleasing units have been obtained, select two of them that go well together and balance them within a rectangle (Plate XXVIII). Here you are dependent upon your judgment, though the experience already gained should enable you to overcome the difficulties.

In this problem proceed in two different ways:

1. Select two of your units; trace them so that they will be a short distance apart; place a dot at what you conceive to be the balance point of each unit; join these two dots by a straight line; make

on that line what you feel to be the point of balance of both units; or, in other words, how much attraction, according to the best of your judgment, does

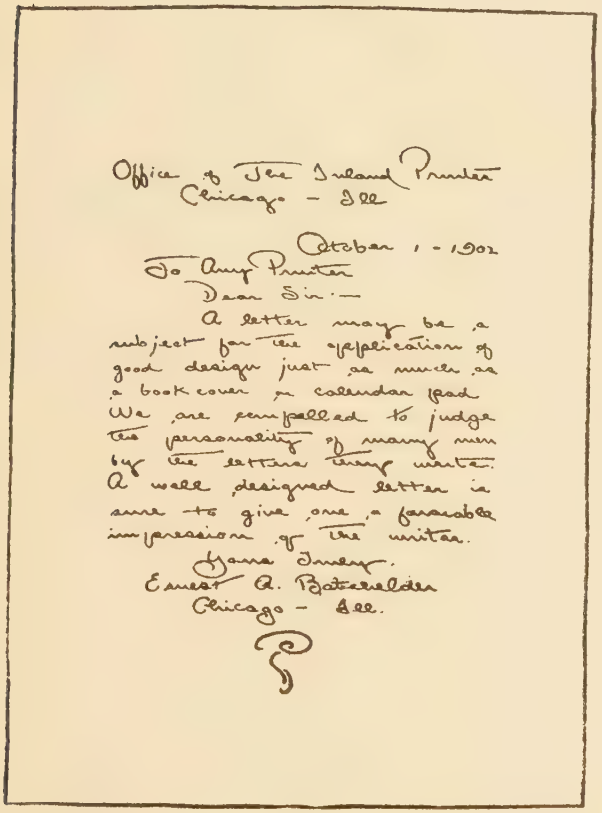


each unit exert? Last of all, place about the result an enclosing form that will be suitable in measure and shape to the units themselves, taking care that the center of this form coincides with the point of

PLATE XXIX

balance already found. The enclosing form should not be so large that the units appear to be floating, or so small that they are cramped for room.

PLATE XXX


Office of The Inland Printer
Chicago - Ill
October 1 - 1902
To Any Printer
Dear Sir: —
A letter may be a subject for the application of good design just as much as a book cover or calendar pad. We are compelled to judge the personality of many men by the letters they write. A well designed letter is sure to give one a favorable impression of the writer.
Yours truly,
Ernest A. Bateselder
Chicago - Ill.

2. To still further test your sense for balance, reverse the process. Start with an enclosing form; place somewhere within that form a unit; then place

within the same form a second unit that will be properly balanced with the first one.

How many of us consider the value of a carefully designed letter? We have to judge the personality of many men by the letters they write. A letter may well be a subject for the application of the principles of design. First of all do not allow the letter-heading to be conspicuous. It is disagreeable to have a man shout at our ears — or at our eyes either. Be satisfied with a simple, well spaced heading. Then think carefully of the body of the letter; watch the margins and allow a bit of silence all about the writing. See that the whole, as a page, is well spaced and properly balanced.

CHAPTER IV.

"Men do not attain perfection by striving to do something out of the common. Perfection is acquired by doing common things uncommonly well."

A PERSON who discovers a source of enjoyment in the rare qualities of design, shown in Plates XXXI and XXXII, may be said to have made encouraging progress. To understand and appreciate such work is to turn to it again and again for study and inspiration. It survives as a graphic reminder of days long past, when men received compensation for trying to live up to their ideals; when there was less hurry in the world and more time for thought and care in the perfection of a piece of work. Beauty in common things was the rule, not the exception, for workers were craftsmen in those days, designers as well as artisans, hence something well done was more highly esteemed than speed and cheapness of execution.

Workmen knew the joy of work, because the whole man—mind, eye, hand, heart and soul—entered into the completion of a task. Too many of us in these days work eight hours per day, for a consideration, and spend the remaining sixteen hours trying to forget our work.

PLATE XXXI

The two designs mentioned are of velvet brocades made in Italy during the sixteenth century. That century stands in history as a period of notable

PLATE XXXII

achievement in design, in the Orient as well as in the Western world. The Japanese workers in pot-

tery, bronze, lacquer, and ivory; the sculptors, the builders of temples and the print designers, seemed imbued with the same spirit of beauty that entered into the work of the painters, sculptors, weavers, printers and craftsmen of Europe.

We are not aiming to design velvet brocades; but let us see what can be found in these two designs that will be of value to us in the present stage of our work. In the first place it must be understood that the originals were not in black and white. To the statistical skeletons here given add a beautiful harmony of two tones and the soft transient texture of velvet, and we have an exquisite symphony of tones, measures and shapes. But even with the loss of so much that is desirable, there is still sufficient material for profitable and continued study. Good designs are good to the core and not of passable interest at first glance alone; they will bear analysis.

It is well to note that the limitations of design have been frankly met; no effort has been made at concealment, quite different from many of the florid, realistic wall-papers and textiles of to-day, in which the designers would seem to be trying to make us believe that geometry and mathematics play no part in their art. The motif in both plates suggests Nature; but the results are sufficiently abstract in character to bear out the assertion that the artists' chief concern was to plan a rhythmic, carefully balanced, harmoniously related arrangement of lines and areas, all in accordance with Nature's principles though not in direct imitation of her. Care has been taken not to trespass upon the domain of the painter, and place before us a naturalistic rendering of flowers

and leaves. A botanist would certainly find it hard to classify the designs. There is a splendid interrelation of parts to be found on further examination, particularly in Plate XXXII. Then, too, there is such a careful distribution of blacks and whites that neither asserts itself at the expense of the other, all accomplished in such way that one is led to marvel at the refined skill of the designers.

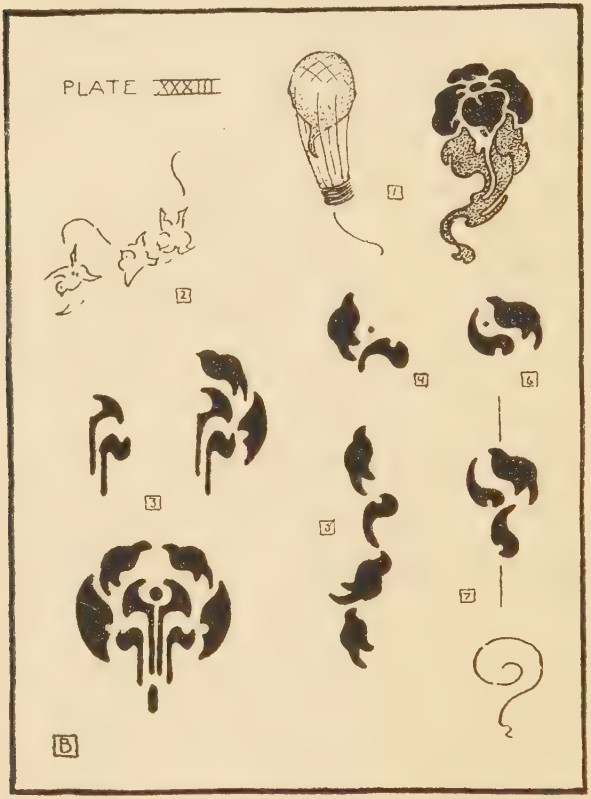
With these plates before us perhaps it would be well, at this point, to define one type of tone balance. The simplest type of tone balance is gained by an even distribution of two tones in such way that neither shall dominate. A reference to previous plates will show several examples that may be properly included within the meaning of this definition.

PROBLEM:

It is for just the things found in the two designs now shown that we are going to try in the present problem, in a modest way to be sure, with the set of spots given in Plate XXVI. Let us have results in which there is rhythm and balance with symmetry (Plates XXXI, XXXVII, XXXVIII), while in others there will be rhythm and balance without symmetry (Plates XXXII, XXXIV, XXXV, XXXVI). This problem demands more time and greater perseverance than previous ones, but the results have additional charm, for there is more of grace and beauty of line, and an opportunity for one's imagination to express itself more freely, yet strictly within the bounds of the principles thus far defined.

This work will have to be divided into two parts. The first step is to make a unit that will be rhythmic

in itself; the second step is to develop that unit over a surface in regular repetition. Various units capable of pleasing repetition were shown in Plate XXVII,



and with the experiments made in the last lesson a certain familiarity with the spots has been acquired. Examine Plate XXXIII for additional suggestions along the same line. What constitutes a rhythmic

unit, one that will appear to possess life and motion, without the necessity of repetition ? Some writers have divided forces in nature and art into two broad, general types — static and dynamic. In architecture, for instance, a pyramid would be considered as static, a construction suggesting immovability. Egyptian architecture is of this character; one feels oppressed by the permanence and solidity of the structures that remain. Perhaps the designers were influenced by the long, flat horizon lines of the desert, or by the sluggish current of the Nile, for in all their work such lines are in evidence. In direct contrast with this, the work of Greece, while none the less substantial, is more in sympathy with our way of thinking, for it suggests vigor, vitality, action and the joy of present life, rather than death and the uncertainties of a future life. Those designers of Greece must have found inspiration in the dancing waters of the Mediterranean, or in the beauties of the hills and mountains about them.

In nature we might liken a toad, providing it is pardonable to descend so abruptly from the sublime to the commonplace, to a static force. He would not be cited as an example of rhythmic, graceful movement. But the flowers and trees, under which he lives, represent this other force, a reaching outward and upward into the air and sunshine. Note the unfolding of the morning-glory, or the stately upward spreading of the elm. It is the increase of interest and importance, as the eye ascends in each case, that gives a sense of life and action. And so in the art of Greece we find a similar uplifting force. The architect made the capital of his column or

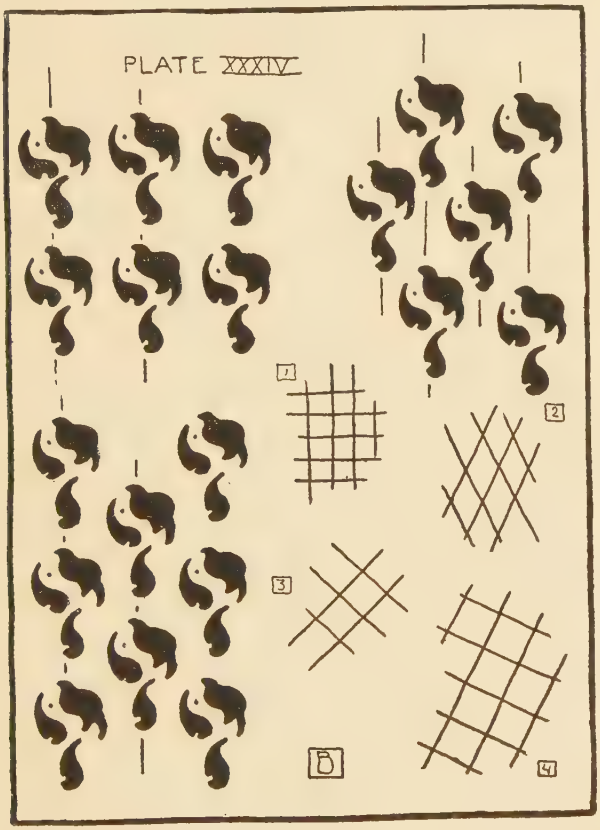
the cornice of his building of the greatest interest, and on these features he placed his finest work.

This line of reasoning can not be carried to an extreme in the problem at hand, though it contains ideas that may be of service, for our task, too, is to construct something that will be associated in our imaginations with rhythm. This association may lead us to think of the flight of birds, the opening of a flower, a boat, a balloon, or, in fact, anything suggestive of motion.

Plate XXXIII, Fig. 4, shows three spots that are unrelated; the eye is unable to grasp all three of them at once. There is more of unity in Fig. 6 and certain features at the bottom of this result may lead to the addition of another spot, as in Fig. 7. Here we have something that seems capable of action, associate it with whatever we choose. Fig. 5 shows one thing to avoid. Here there is a certain relation of curvature, but there are so many weak points in the line that the attention is not held. It is too loose in construction; the spots should have been grouped more compactly.

Now let us take Fig. 7, and see if the result will repeat successfully over a surface. This brings us to the second step in the problem. The general plan of our work does not contemplate any extended analysis of the anatomy of pattern, nor, indeed, would this be the proper place for such analysis if it were to be given. Plate XXXIV offers sufficient material for present purposes. The unit should be carefully drawn on a small piece of paper and painted black, with a vertical line extending through the center. Then take a clean sheet of the trans-

parent paper and draw a light pencil line through the center from top to bottom. Place the small sheet containing the unit beneath the transparent paper, in such position that the two vertical lines coincide;



trace the result. Similar care should be taken with each tracing of the unit, in order that regularity and unity of direction may be secured in the final result.

PLATE XXXII
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Having traced the first unit, where will the next one be placed? This must be ascertained by an experiment, perhaps by several experiments. To answer the question would be to do your thinking for you, the thing it is hoped to avoid. In fact, the question could not be answered in a way to produce satisfactory designs, because everything depends upon the size, shape, and general character of the unit of repeat. Move the small sheet about under the transparent sheet, try the effect of the unit above, below, at one side, before making the second tracing, for when the unit has been twice repeated you have secured the key to the design; the spacing of the rest of the repeats must be the same. Try to think of the appearance of the design when completed. It is difficult to do this at first, though it is the way in which a designer works. He acquires ability to think of the complete result while still planning the general features; with the whole in mind he develops the parts. This brings unity of treatment. But to attain this end experience must be his most valued teacher. Persistent, eternal, dogged study, observation, and experiment — these are the things that go far toward the development of what is commonly referred to as the "knack" possessed by the successful designer. There are no short cuts to success, and the tortoise very often arrives at the journey's end before the hare.

No construction lines will be needed in this work other than the vertical lines. The lines at the bottom of Plate XXXIV are added to show the directions that the repeats may assume. In the three examples, numbered 1, 2, 3, it will be seen that the angle

SHAPE RHYTHM—AREAS

of the repeats to the right and to the left is the same. Fig. 4 shows something that it is well to guard against, a result in which the lines of repeats are at different angles. Plate XXXV shows the effect of this sort of thing. Here the relation of parts is good; but the straight, formal line of repeats from left to right is out of harmony with the general movement from unit to unit. Wherever the eye may glance it is abruptly hurried away to the right by those strong, dark lines in spite of a desire to follow the more pleasing rhythm in the other direction. If this design were intended for a wall-paper or a hanging, serious fault might be found with it. As it is, the effect would be improved by either raising or lowering the alternate repeats, in order to get the angles shown in the other plates.

CHAPTER V.

"In order to live, Art must be free in its outward expression, though strictly regulated as regards principles."—Viollet-le-Duc.

THE meaning of shape rhythm in design, as regards both line and area, has been made clear, so that hereafter it will not be necessary to add explanatory phrases such as "interrelation of parts," "connection of lines," etc. The importance of shape rhythm has demanded an unusual amount of space. It manifests itself so often and under such varied conditions that one is led to think of it as a primary principle of effective work. We applied it first as a "repetition of a unique shape." Then we considered it as a carefully related arrangement of lines and areas; next as a shape that might be rhythmic in character without necessarily involving repetition, and finally all three of the above manifestations were combined into a single problem. Any one who has attempted to solve this last problem, though, must have discovered that shape rhythm alone will not produce desirable results. A balance and harmony of shapes and measures must be thought of, and the relation of tones must be carefully studied. A successful solu-

tion of the problem bears witness to the statement that unity in design is lost when one principle is given undue emphasis at the expense of other principles.

PLATE XXXIX

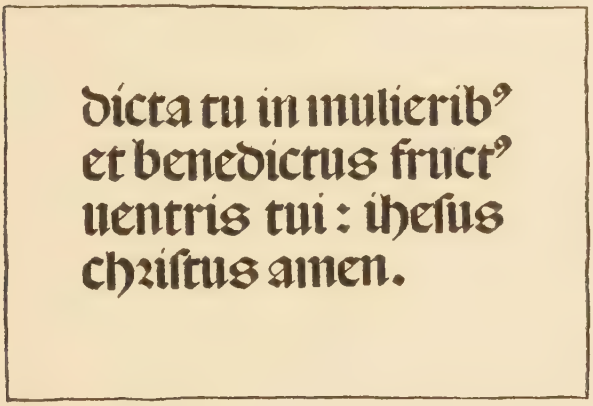


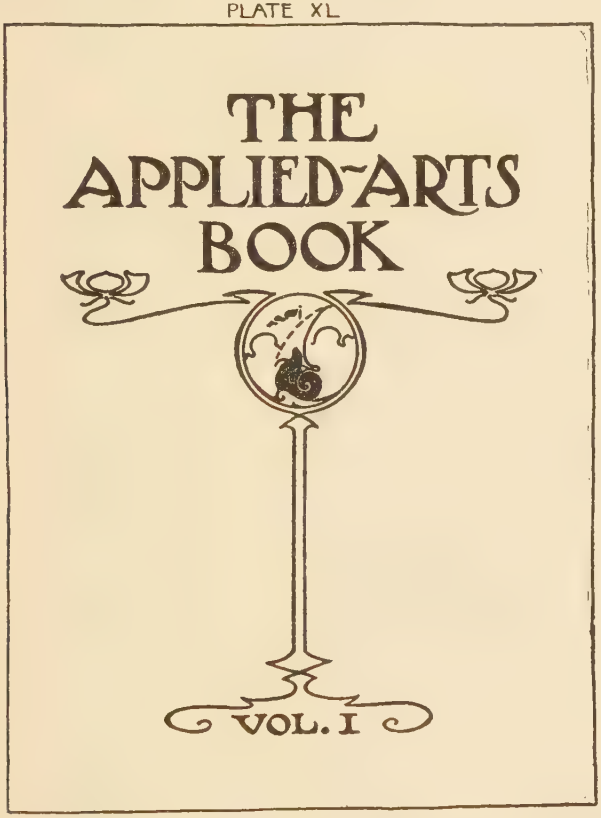
Plate XXXIX is an example of printing of the fifteenth century, from the press of Ratdolt. The words are unknown to many of us; but this fact need not interfere with an appreciation of what might be called the musical quality of the work, due partly to its depth of tone, but more to the rare rhythm and harmony of shapes. It is music and poetry to the eye. Note the way in which each letter is related to its neighbors. Each letter is beautifully proportioned in itself; but, in addition to this, the individual letter is made with the idea of association with other letters. Much of this rhythmic quality comes, no doubt, from the fact that printing at that time was only a few steps removed from the penwork of the illuminator of books and manuscripts, who,

through long years of experience, naturally made letters of such character that his pen would glide as readily as possible from letter to letter. In the course of time, as printing became further removed from the illuminator and the latter dropped from sight, the influence of pen-made letters was less potent, because the process of cutting type from metal was a process of designing single, disconnected letters instead of words. Rhythm was given less thought, with the result that, in many later types, we find letters that are pleasing when considered by themselves, but, when combined into words and pages, they are incapable of producing any such degree of pleasure and satisfaction as may be found in some of the older types in which unity of the whole is as much in evidence as beauty of the parts. Indeed, one sometimes wonders if many of the modern "fancy" types could have been planned by designers who ever heard of such words as unity and consistency. A comparison of this old type-face with many later styles of a similar character must result in an advantage to the former, because there we have design that is dependent for beauty upon simplicity of treatment, with thoughtful regard for proportion, rhythm, harmony. Whenever beauty is thus reduced to its simplest expression, it is unsafe to attempt a modification or an adaptation by adding superficial features.

Plate XL is an example of rhythm under other conditions. It is a simple piece of work, showing the effective decorative use that may be made of one or two well-chosen lines. In fact, it is so simple that one is led to remark, "I might have done

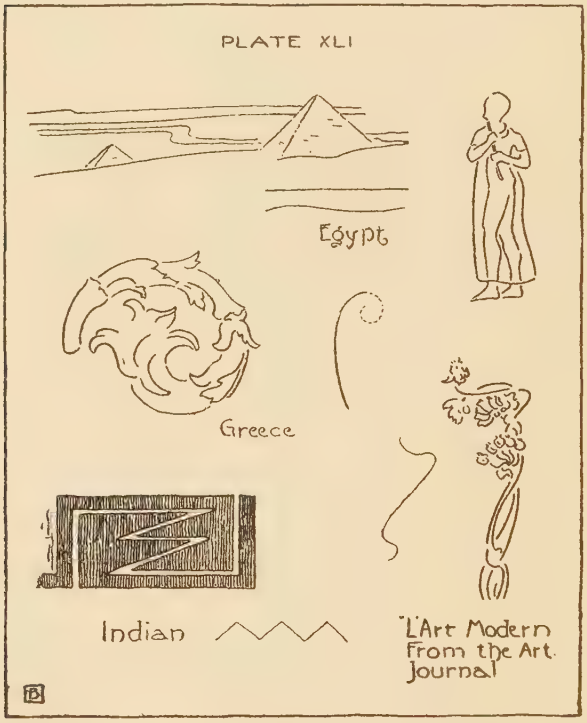
something like that myself." Here we have a good example of shape balance, of stability that comes from measure balance, and of a tone relation that offers just enough of "silence" to effectively display

PLATE XL



the design itself. As a whole the design seems to partake of some of the buoyancy suggested by the little sketch within the circle.

The use of lines in designs of the past forms a most interesting study. The work of the different historic periods of design shows that each period or style possesses certain characteristic features by means of which the examples of that style may be



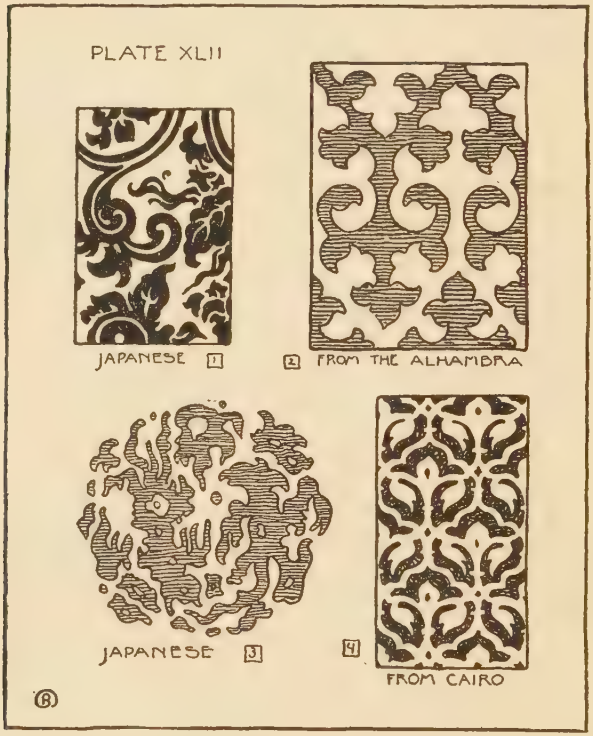
recognized. There is a recurrence of familiar lines, shapes and forms that serves to maintain a family resemblance. The various styles might even be classified according to the general type of line

that dominates (Plate XLI). The art of Egypt, for instance, would be represented by the straight line, or the long, slightly curved line. Greece gives us what Mr. Ruskin calls the "infinite curve," or its logical conclusion, the scroll. The angular rhythm stands for the Indian, while the "new art" would be known by the presence of the "erratic curve."

The term L'Art Nouveau, by the way, has been woefully misconceived and misused. At its inception it was the gospel of line and proportion in design as opposed to the gospel of "style." But, unfortunately, like so many other good things, it has become a fad to be seized upon by the man whose creed is novelty for novelty's sake, or who must needs be up to date. As a result the term has been made to stand sponsor for weird, meaningless line arrangements, at times passably interesting, but too often totally devoid of beauty, and showing the touch of a hand that understandeth not. It is under these circumstances alone that L'Art Nouveau can become a term of reproach. The true "new art" is not new at all; it is merely a return to elementary principles of design, and, as such, must be counted as a wholesome step in the efforts of man since the dawn of history to make useful things beautiful.

Let us now come back to the subject of a balance of two tones, according to the definition given — namely, such "an even distribution of two tones that neither shall assert itself at the expense of the other." Many examples might be shown in which there is approximately an even distribution of two tones (Plate XLII). Very often in the work of the Arabs, this distribution becomes an exact

duplication, not only of tone, but of measure and shape as well. Fig. 2 shows an instance of this kind. Turn the plate upside down and it will be seen that the white is exactly duplicated in the darker tone. In pavements and wall-decorations,

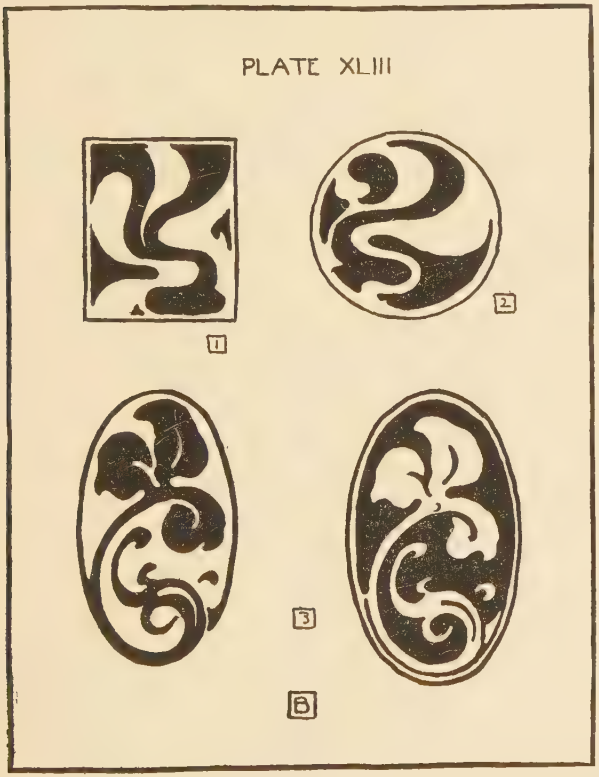


this same idea appears, varied in many ingenious ways. Fig. 1 is from a Japanese silk. If we were to trace this design, reversing the blacks and whites, a comparison of results would show the tones to be

about equal in attraction. Fig. 3 is another case, a bit of imaginative brush play.

PROBLEM:

Make a circle, or rectangle, two or three inches in diameter, fill the brush with ink and see if you can



produce a rhythmic, evenly distributed arrangement of black and white (Plate XLIII). Trace the result, making such changes in the first sketch as may

seem desirable. Such examples as Figs. 1, 2 may serve as illustrations. Fig. 3 is another example in which there is a suggestion of nature. It illustrates the idea that the closer we come to nature the more necessary it is to conform to the law of continuous growth. Even though a piece of work may be purely abstract in composition, the moment something is produced that resembles nature, care must be taken not to violate laws of growth. This idea is recognized even by the Moors, who were not supposed to use any natural forms in design.

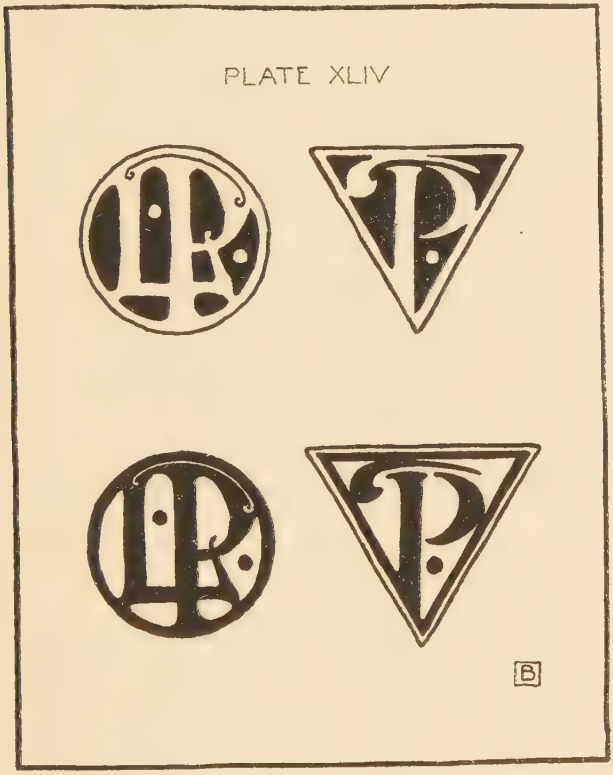
PROBLEM:

Plate XLIV suggests another experiment in a similar use of two tones. Try a monogram, preferably your own, in which a balance of black and white is to be secured. This leads one to wish that the printer's mark might again come into general use. The stamps used by the old-time printers form a most interesting series of designs. Such a mark, like a book-plate or a publisher's seal, adds a pleasing touch of individuality to one's work.

This problem brings us to another step in advance; it is practically the first attempt to fill a given space with a definite motif. Hitherto we have not been limited to a prescribed area. A designer invariably finds it necessary to plan his work in accordance with certain measurements imposed by use, material or process of manufacture. It is only in such things as wall-papers, prints, carpets, etc., that he can work with the idea of indefinite extension, and, even in these cases the unit of repetition must be planned within definite lines.

The next proposition is more properly a question

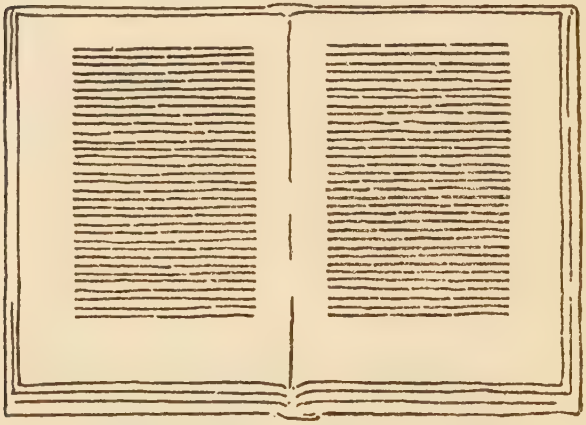
of proportion or measure than of tone, and as such it will be given further study. Space allows us to touch briefly upon the subject here. Let us suppose that it is desirable to secure a balance of two tones



on the printed page of a book. The margins of white on a page serve a useful purpose first of all. The widths of the margins may be determined by a study of the conditions of use; but the proportion of mar-

gins to type is a question of beauty. A comparison of beautiful books leads us to the conclusion that the double page is the true unit. This double page may be made beautiful without the employment of any decorative features other than type and plain paper, providing the proportion of one to the other

PLATE XLV



is given proper study. The decoration of the pages of a book is something that a master alone can undertake with success. Walter Crane has remarked that there are numbers of men who can illustrate a book, but that there are very few men who can successfully decorate one. The margin of a page is very much like the frame of a picture. If the frame by means of disproportionate size or excessive decoration, overpowers the picture itself, the chief function of a picture-frame has been overlooked. The frame is intended to aid, not hinder, one's contemplation of the picture. The same idea applies to the

margins of a page. With a few notable exceptions, there seems to be a current notion that a book, designed to be particularly artistic, requires an extensive amount of decoration, whereas, in truth, the books that give a lasting satisfaction are the ones in which the decorative features are the least conspicuous.

Plate XLV is a suggestion of the point we have in mind. The eye feels a sense of unity here. An exact tone balance has been secured by making the measure of margin equal the measure of the body of type. In many books that show a recognition of the double-page unit, the whites are overdone to such an extent that the measure of type to paper seems entirely inconsistent. Here again the page may be likened to a picture and a frame. The frame should not be so large that we are forced to start a diligent search for the picture enclosed.

CHAPTER VI.

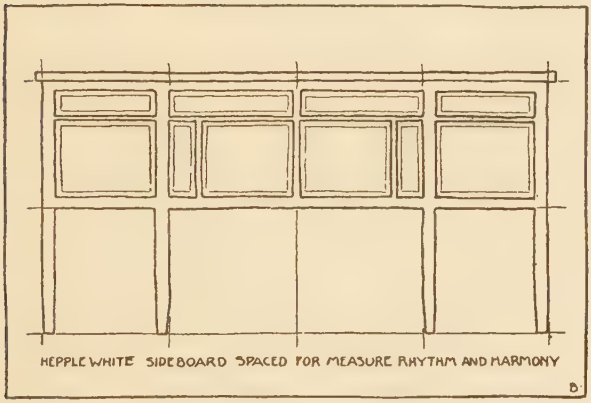
"The man who has eye and intellect will invent beautiful proportions, and can not help it; but he can not tell us how to do it. There are one or two general laws that can be told; they are of no use, indeed, except as preventives of gross mistakes."—John Ruskin.

E are often told to make such and such a piece of work in "good proportion." "See that your border is in good proportion to the whole," or, "make the margin so that it will be in good proportion to the page."

What does the expression mean? Can the term be defined in such a way that we may give to another any adequate idea of what we really do mean? We are often conscious of the fact that the various proportions in a design are at fault; a border is too wide for the text, a margin is too narrow. We may be able to perceive and adjust this fault; but is there any law or principle that will help us to avoid a similar fault in the proportions of the next piece of work that we undertake to do?

Mr. Ruskin speaks of proportion as being of two different kinds, apparent and constructive. By

apparent proportion he seems to refer to those relative quantities that are established for the sake of pleasure alone. It is merely to be agreeable to the eye that the pattern on the wall-paper is large or small. It is not at all a question of utility. By constructive proportion he refers to the adaptation of quantities to function or use. Supposing we decide to make a fine table. If our table is to be of pleasing form and useful as well, there are certain proportions of length, breadth, height, size of legs, etc.,



HEPPLE WHITE SIDEBOARD SPACED FOR MEASURE RHYTHM AND HARMONY

that must be observed. All of this comes under the head of constructive proportion, because we are guided thus far by the question of the use for which the table is to be made. The various proportions in a tea-table would be lighter than in a dining-table. Common sense is the chief factor in establishing proportions of this sort. But, supposing we decide to place an inlaid pattern on the top of the table. Here we come to the idea of apparent proportion,

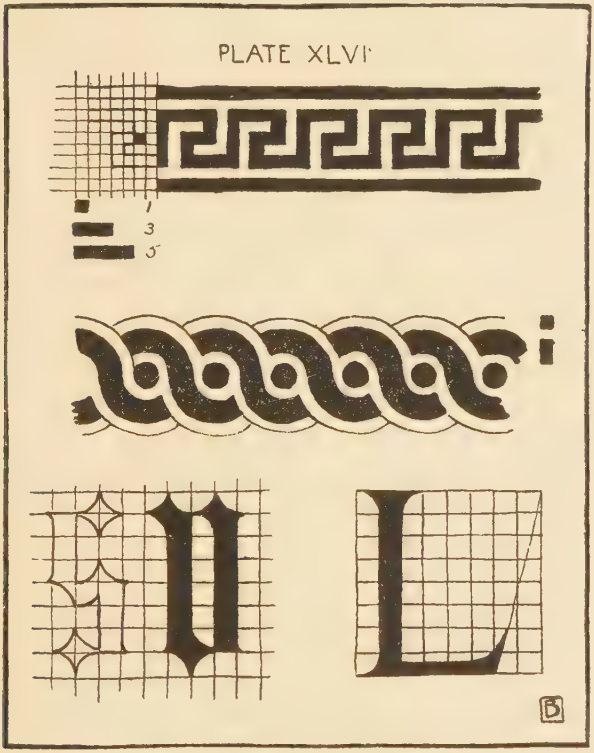
for the width and pattern of the design on the top has nothing to do with the structural features. It is there to please the eye ; utility is not the judge in this case. Our aim is to so arrange the different parts of the pattern that the measures will be brought into some harmonious relation. Of course, no law can be stated by means of which the required proportions can be established, because every problem that confronts a designer calls for individual consideration. We can, however, by study and experiment, come to some general conclusions that may be helpful.

It seems unwise to attempt a division of the question into two parts, because all proportions are so intimately related (or should be) to the structural lines in a design that it would take a philosopher of more profound reasoning powers than most of us can claim to say which proportions are constructive and which are apparent. In Plate XLVII, for instance, shall we say that the borders on that vase are determined only by the agreeable impression that they may make upon the eye ? We might think so at first glance; but we will presently examine the vase with more care and will find that the borders are so closely connected with the structural features that it would be impossible to vary a line without completely upsetting the whole scheme.

So let us simplify matters and say that by good proportions, whether constructive or apparent, whether in a house, on the page of a book, or in the formation of a single letter, we mean measure harmony, the means by which varying quantities may be so related as to be agreeable to the eye.

MEASURE HARMONY

Let us examine a few examples of good design and see how measure harmony has been and may be secured. Plate XLVI, Fig. 1, is the familiar Greek fret, severely simple, yet beautiful withal. Its



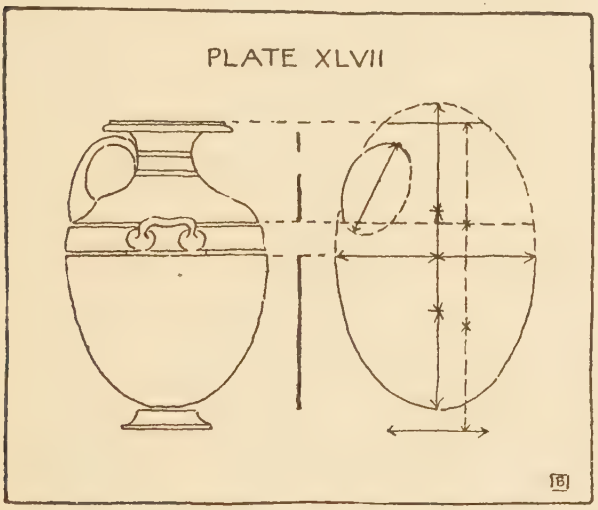
beauty is chiefly dependent upon the recurrence of a unit of measure. The little square at the left is the common divisor of the entire design, and its recurrence in ratios of 1 : 3 : 5 establishes a series of measure relations that may be easily seen at a

glance. We are conscious that there is something pleasing about that simple border; and the designers of times past have likewise found it pleasing, for, far from being Greek, it may be said to be universal; it occurs again and again in work from such widely separated sources as China, Peru, Alaska, and Scandinavia. Nearly every nation has, sooner or later, invented that simple fret. Fig. 2 is another example of similar character; it is hardly necessary to point out the fact that a unit of measure exists. Examples might be repeated indefinitely, in architecture, textiles, furniture, pottery, etc., in which the various quantities or measures have been related by a common divisor. In making an alphabet, for instance, if the letters are to be of such character that they will go well together, there must be some unit of measure to govern the different proportions (Figs. 3, 4).

Let us carefully examine two notable examples of measure harmony. The Greek vase in Plate XLVII has already been cited as an admirable specimen of a dominant shape. At the time, it was remarked that other desirable qualities could be found here, somewhat foreign to the work of our "china decorators" of to-day. A dominant measure has been used, as well as a dominant shape. The designer chose as an underlying form an ellipse in which the diameters bear the ratio of 2 : 3. Take one-half the short diameter as a unit of measure and you will find that it goes three times in the height. It will be noted that a section of the ellipse has been cut off at the top by the mouth of the vase; but in order to retain his original proportions,

the designer added this measure at the bottom as the height of his base. The half diameter occurs again as the width of this base and as the height of the handle.

Other definite measure relations might be pointed out here; but these will answer the purpose. This repetition of a measure gives a sense of rest, of



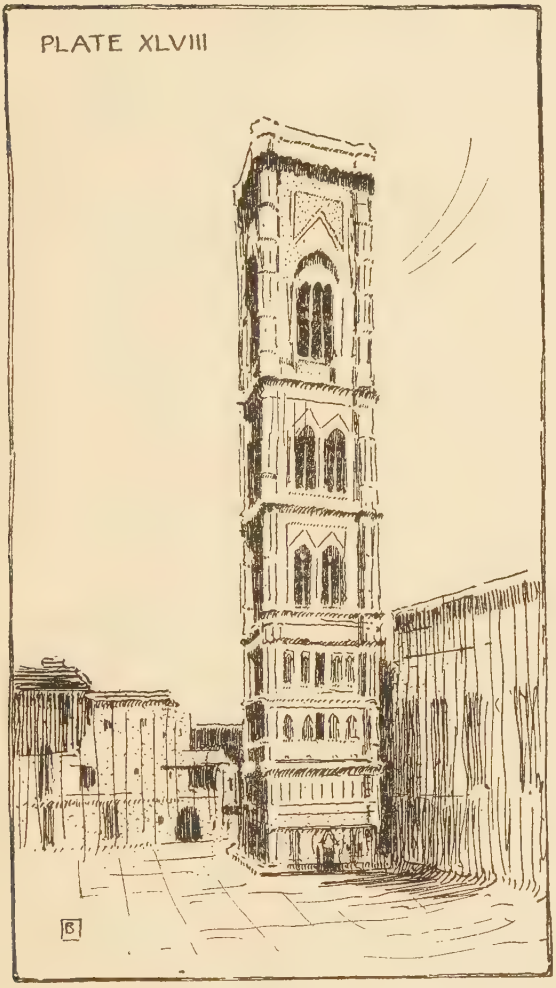
satisfaction; we are able to feel the big, broad proportions at once without being confused by the clamor of unrelated quantities.

Now study the borders and their connection with the structural features, a border in the narrowest part and one in the widest part, so related to the handles that it would be difficult indeed to make a change anywhere without going back to the very first proportions that were established.

This, then, is the law of measure harmony; see that the parts of a design are governed by a dominant measure. This dominant measure may be obvious to the casual observer, as in the Greek fret, or it may be hidden within some beautiful form unknown to any but the careful student. Its presence brings unity, not uniformity. Do not, under any circumstances, confuse these two terms. Unity is the life of art; uniformity is its death. In Giotto's tower (Plate XLVIII) there is unity. A cube is the unit of measure; six cubes placed one above another, give the big proportions; but this would also result in uniformity, and to avoid this, variation in the different space divisions has been restored to, with a constantly increasing interest as the eye ascends. With all the variation, though, the dominant measure still remains.

As preliminary to the solution of one or two problems, examine the piece of furniture from Korea, shown in Plate XLIX. As a problem in design it is merely a rectangle to be cut by lines into pleasing space divisions. If the designer had desired uniformity he would have made those divisions all alike, as in a checkerboard; but uniformity is repulsive to the Oriental. Unity, though, he generally secures. This design is but one of hundreds of similar character to be found in chests and cabinets made by the artisans of China, Japan and Korea. It is hard to say that one of these chests is any more beautiful than another — and yet no two of them are at all alike in space divisions. Did it ever occur to you that a simple rectangle could be divided in such an immense number of interesting ways? We

PLATE XLVIII



call ourselves a nation of inventors; but our inventions are largely utilitarian, for when it comes to a problem in which the simplest element of beauty is involved, we shall find the Oriental possessed with such a restless fertility of invention that we can only stand aside and wonder at it all.

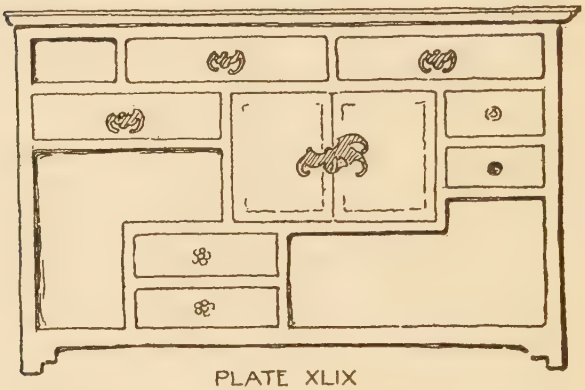


PLATE XLIX

PROBLEM:

Plates L, LI, LII show a few studies in the arrangement of lines and measures. Make several rectangles of different ratios of length to breadth and try some experiments in cutting them into pleasing space divisions. Stand the results in a row, and a comparison will be found interesting and profitable. It sounds like a very simple proposition, yet it is in substance one of the first and most important questons to be solved by the painter, architect, designer, printer, and on its proper solution depends much of the beauty of the work at hand, whatever its nature may be.

Compare the results shown in Plate L. Fig. 1

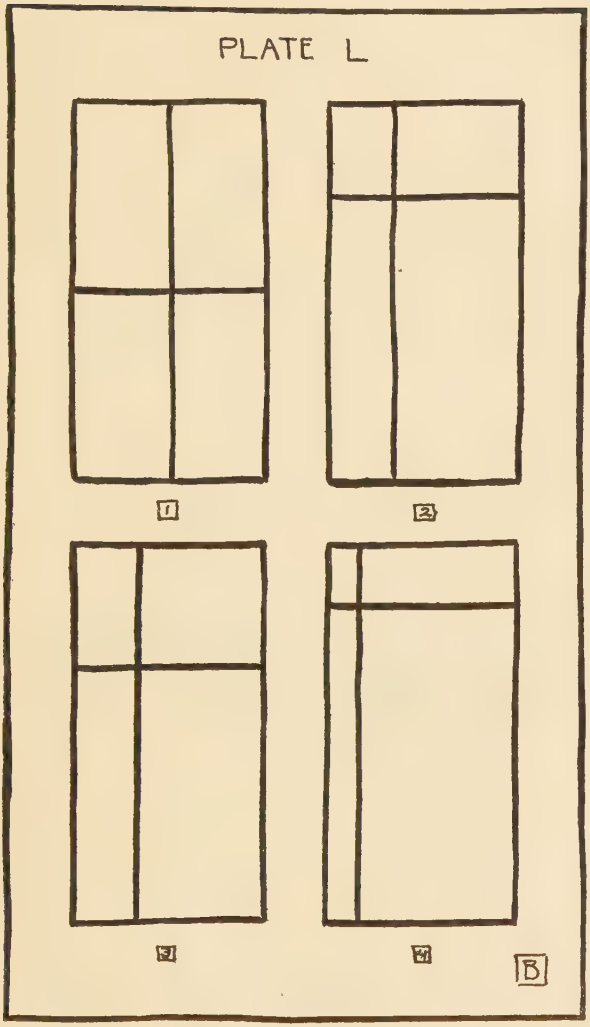


PLATE L
1
2
3
4
B

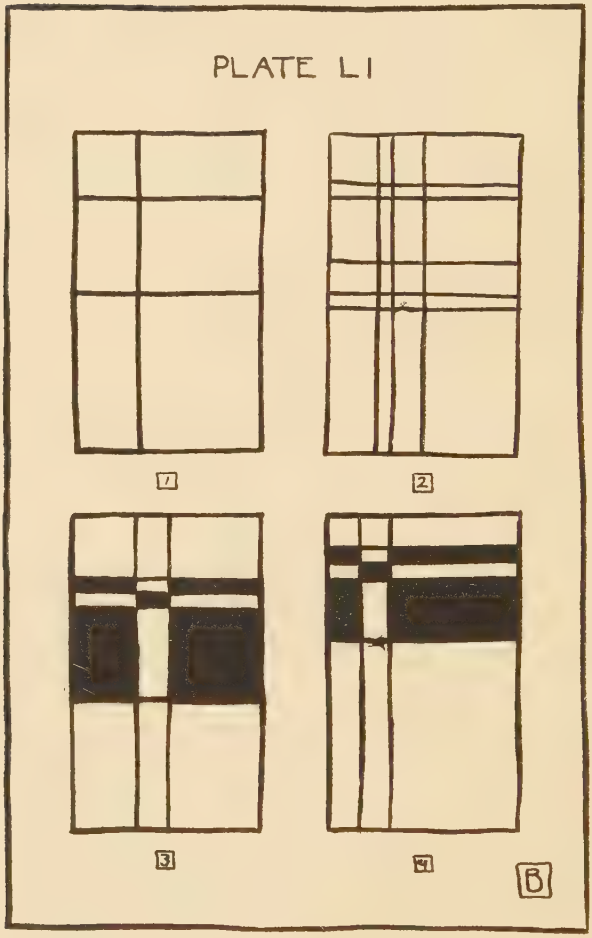


PLATE LI
1
2
3
4
B

approaches too closely to uniformity; in Fig. 2 a slight additional interest is given. There is more variety here; possibly there is too much variety, too great a difference between the large measure and the small one, for when Fig. 2 is compared with 3, the comparison results in an advantage to the latter. Another change is made in Fig. 4, but here we readily perceive that 3 is the better example; the spaces are more closely related; in 4 there is so much variety that unity has been lost and it is hard to grasp all the measures at once. In Plate LI another division line is added, and at once it is evident that another pleasing measure relation has been established both in Figs. 1 and 2. To carry the problem further, paint in some of the spaces and compare results once more. As between Figs. 3 and 4, the former would be chosen. In Fig. 4 the difference between the large measures and the small ones is such as to make the harmony doubtful.

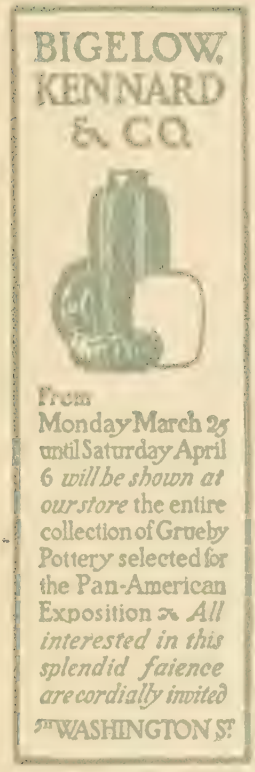
Now, in accordance with our definition of measure harmony, all of these examples are governed by a common unit of measure, the quarter-inch of the "squared paper." But we have seen that the results are not equally good. A measure harmony, then, requires something more than the presence of a common unit of measure. It is less important that we know such a unit to be present in a design than that we feel it to be there. If there are two small measures associated with two unusually large ones, as in Plate L, Fig. 4, the eye is unable to perceive any relation in these various areas, but in Fig. 3 a compromise has been brought about, the different measures have been reconciled and we feel that they

are definitely related. There is an orderly decrease in the various measures from large to small.

Now try some other rectangles in which the spaces are cut in another way, by lines parallel with the sides, as in Plate LII. How slight the difference between Figs. 1, 2, yet how much more beauty is

to be found in the latter, because uniformity gives place to unity. Have you ever observed the door panels in your own house? How are the spaces divided? Examine the fronts of beautiful buildings,

PLATE LIII



such as the Boston Public Library. Note the cutting of the spaces and the way in which the different measures are related so as to give unity without giving uniformity.

Plate LIII shows an advertisement clipped from a newspaper. It is a piece of work of decided beauty. The space has been cut into three divisions, unequal yet related by a decreasing ratio from large to small. (Compare this spacing with the Greek vase in Plate XLVII.) The size of the border is in harmony with the lettering. There is just enough white to balance the black. The black spot is just large enough and placed in the position to be most effective.

The solution of a few simple problems involving the question of space relations will open one's eyes to examples in all lines of work.

CHAPTER VII.

"Nothing made by man's hand can be indifferent; it must be either beautiful and elevating or ugly and degrading."—William Morris.

HE more one seeks examples of work with which to definitely illustrate a principle of design, the more one becomes impressed with the vital relation of this subject to printing, and the stronger becomes the conviction that few workers have such constant hourly opportunity for the application of the judgment and taste that is developed by an artistic training as the printer. The American public is undergoing a tremendous awakening to the value of honest, sincere craftsmanship. There are numbers of people who stand ready to pay the price demanded by the carefully trained worker. In no way can this portion of the public be reached other than by work that will stand the test of careful criticism. A printer may call his place of business a "printshop" and by unique devices proclaim his productions as "artistic"; but he must never forget that the very ones to whom his appeal is directed, the ones whose approval is worth having, are quick to detect the difference between the thoughtful work of the man

who is endeavoring to express the best that is within himself, and the affectation of the man who strives to catch the eye with the sparkle of borrowed finery. Produce something that is in truth artistic, based on that careful study which places a man's mark high above the tide line of fad and fashion; do this and sooner or later your goods will receive recognition, else the experience of other workers in other lines of industry counts for naught.

Take the one proposition that has been given under the head of measure harmony. Consider for a moment the importance of a persistent study of this question. It confronts us in the division of the space at hand, in the various measures of type to be used, in the relative proportions of type to space, margin, border and decoration. The only way to acquire a sound judgment in these matters is by exercising such judgment as you may already possess. "We learn to judge by judging." Too many of us are inclined to depend upon others to do our thinking for us; it saves a deal of bother. We have seen men who would welcome an artistic training but who would prefer to acquire it in the form of a "handy reference" that might be tucked into the vest pocket and consulted whenever occasion demands. Do you collect examples of good work? If so, stand a long row of specimens before you and carefully sift them one by one until you arrive at the last half dozen. From these select the one that seems best of all and see if you can state to a second person any sound reason why you made such choice. That is what is meant by exercising one's judgment.

Let us examine a few specimens of work that

have found a way into the writer's scrap-book because they seem to possess some distinctive merit that raises them above the commonplace; good, thoughtful work, without a touch of the affectation that many mistake for "artistic." Plates LIV, LV show two advertisements in which the same material has

been made to fill spaces of the same shape and measure but placed in different positions. Which result is the better one ? We feel that in both examples there is a pleasing harmony between the lettering, the border, and the cut. The proportion of black to white has also received careful study. As space divisions pure and simple, the results are not equally

successful. In Plate LIV, Fig. 1 shows the divisions of the rectangle. It is generally unwise to associate two or more spaces that are almost but not quite the same in shape and measure. In this case the three spaces in the center of the design are so nearly alike that we feel a desire either to make them just alike or to make them distinctly unlike, as in Fig. 2.

So, as between these two, we would choose Plate LV as being the better example. At first glance the space here seems to have been divided as in Fig 1. But a second examination shows that additional charm has been imparted to the work by bringing the word "tiles" into the same width as the middle space. This results in the divisions of Fig. 2. Here we feel the interest, whether we care to analyze the

result or not. We are sure that a pleasing measure relation has been established. The spaces numbered 1, 2, 3 have a certain ratio of increase that serves to bind them together; they have variety with unity.

Variety, then, becomes an important factor in the discussion of design. Variety is often cited as a principle of design. It can not be properly classed as a principle; rather it should be termed a law, for, like gravitation, variety is inevitable. It is necessarily present to a certain extent in every piece of work. You can not draw a mark on a piece of paper or scratch a line in the sand without having variety. By adding a few more lines greater variety may be secured, a quantity of space divisions may be obtained; but you have no design, nothing that will give satisfaction until all those lines and spaces share something in common, until they possess measure harmony, wholeness, unity, whatever we may choose to term it. Any one can make an example of variety, but to subordinate variety to unity requires trained judgment.

It is very much like a team of horses; when each horse pulls according to his own notions, the load remains stationary. There is no lack of variety, but something else is needed. It is only when the driver comes to inspire his team with a common purpose that progress is made.

How great may be the variety in the divisions of spaces before we arrive at the point where unity is lost? Compare the examples in Plate LVI. There is interest in all these results; so it becomes a finely spun question as to which is the most interesting.

We would select Fig. 2 as the best. In Fig. 1 there is not quite enough variety in the lettering; the space divisions are less interesting than in Fig. 2. Here

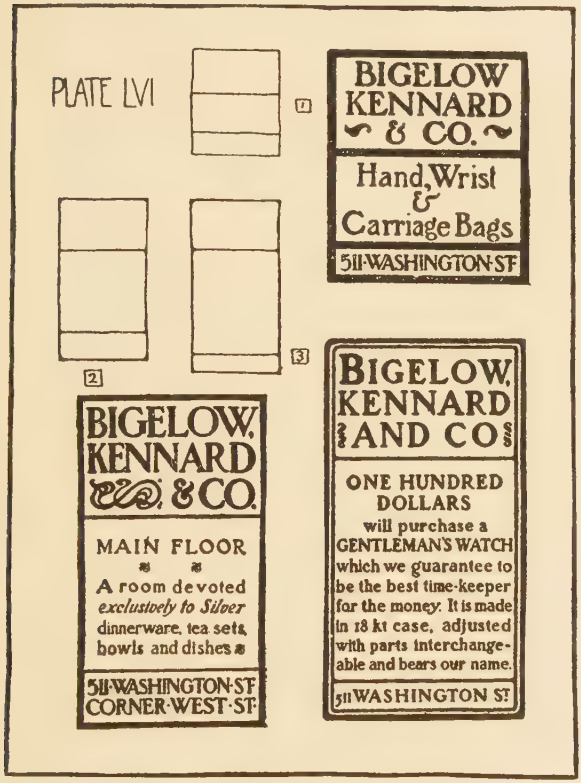


PLATE LVI
1
BIGELOW KENNARD & CO.
Hand, Wrist & Carriage Bags
511 WASHINGTON ST
2
BIGELOW, KENNARD & CO.
MAIN FLOOR
A room devoted exclusively to Silver dinnerware, tea sets, bowls and dishes
511 WASHINGTON ST CORNER WEST ST
3
BIGELOW, KENNARD AND CO
ONE HUNDRED DOLLARS
will purchase a GENTLEMAN'S WATCH which we guarantee to be the best time-keeper for the money. It is made in 18 kt case, adjusted with parts interchangeable and bears our name.
511 WASHINGTON ST

is variety with unity; the spaces and the lettering are unlike, yet we feel that "the driver is present." In Fig. 3 the spacing has greater variety, but it approaches the point where unity in the space divi-

sions is lost. The little space at the bottom is sorely crowded by its big neighbor.

Note the relative proportions found in the two title-pages shown in Plates LVII, LVIII. Turn them upside down if you choose; they are beautifully

PLATE LVII

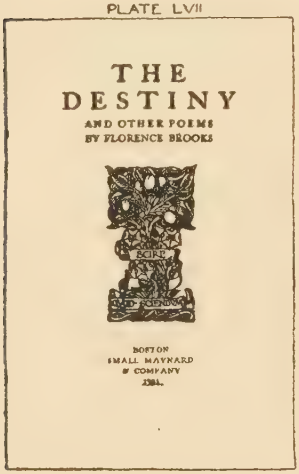
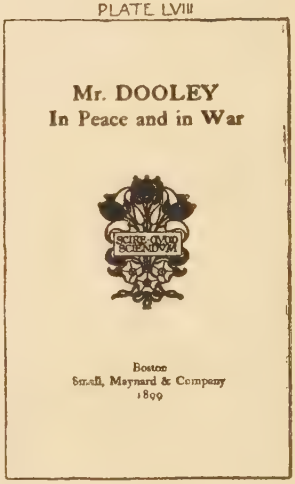


PLATE LVIII



spaced whichever way they may be looked at. Plate LVII is particularly interesting as a study in the consistent variety of type that has been used. It is encouraging to find that publishers seem to have awakened to the opportunity furnished by the title-page of a book for a display of tasteful design. Until recently one might have looked in vain through hundreds of books in search of an interesting title-page. Numbers there were that possessed the merit of inoffensiveness; a few specious efforts were to be found that were unendurable, but the title-pages were rare that had sufficient merit to tempt the

reader to delay the turning of the page for a second glance. Now, however, one can not venture into a book-store without peeping at the title-pages of the new volumes, in anticipation of a "rare find."

Plate LIX explains itself. It is a concise statement in illustrative form of what has already been said.

Do you ever have occasion to draw a picture or make a poster or take a photograph? Most of us try a hand now and then at one or all of the above

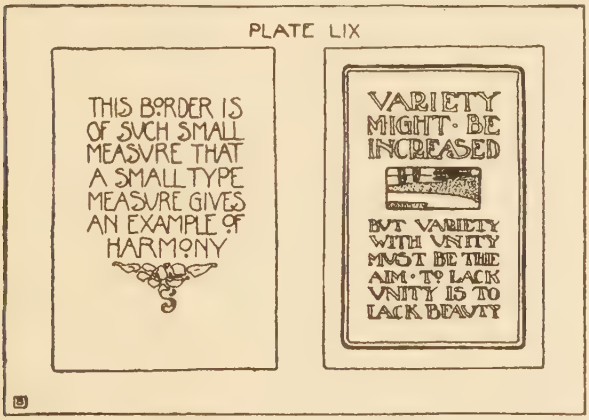
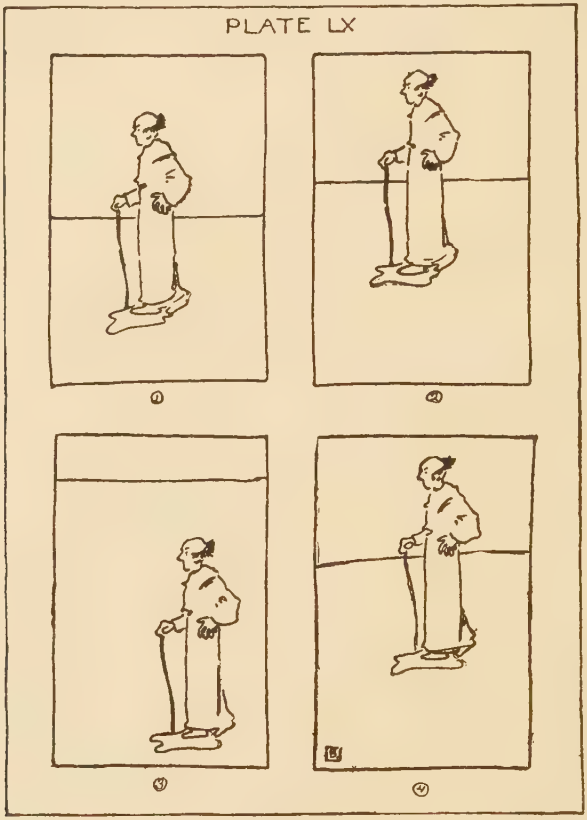


PLATE LIX
THIS BORDER IS OF SUCH SMALL MEASURE THAT A SMALL TYPE MEASURE GIVES AN EXAMPLE OF HARMONY
VARIETY MIGHT BE INCREASED
BUT VARIETY WITH UNITY MUST BE THE AIM TO LACK UNITY IS TO LACK BEAUTY

feats. Supposing we have an illustration to make. A monk and his shadow are to walk in the garden. Many of us, it is to be feared, would hasten to secure some one to pose in a real garden, with a real cowl and a real shadow, and then with such technical skill as we are able to command, would endeavor to faithfully portray all this realism of light and shade, distance, roundness, etc. But is this all that enters into the making of a picture? Possibly we

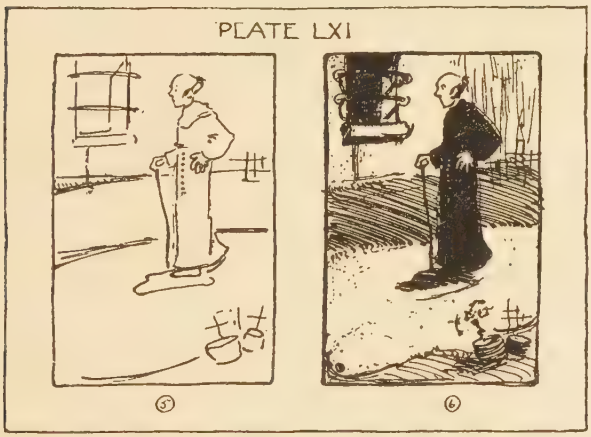
might keep in mind the amateurish dictum that "The man should be placed a little to one side," in order to avoid a set formality. This is well enough



as far as it goes; but without some clearer ideas on the subject of pictorial composition our work would inevitably partake of that same, commonplace appearance that distinguishes the larger part of the

work of the average amateur, who conceives "truth to nature" as being the chief aim of art.

Take the monk, with a straight line for the garden, and see if an arrangement can be secured that will represent variety with unity (Plate LX). In Fig. 1 there is unity, but the variation is not sufficient to interest us. The monk may be raised to increase the variation, as in Fig. 2; but here we feel



a desire to gain greater variety at the left and right, as well as at the top and bottom of the picture. The composition may be changed, as in Fig. 3. Here there is enough variety, but no unity; the straight line forms a picture by itself, unrelated to the monk. Fig. 4 is more satisfactory because it furnishes as much variety of spacing as is consistent with unity. None of the spaces are alike, yet they are so related that they are readily grasped as a whole. Compare these sketches with the line arrangements shown in

Plate L. It matters not whether we are dealing with lines, types, title-pages or monks, the same problem of space division confronts us, and upon its successful solution depends much of the beauty of our work.

Now, to continue our picture, as in Plate LXI, let us sketch in a few essential details (Fig. 5), and secure a balance of the various measures. Then it is time to go to nature, but not until the composition has been thought out. Nature is a good model; but she will not do our thinking for us.

CHAPTER VIII.

"An original style must be based upon the natural principles of supplying the requirements of the case in the readiest common-sense manner, and decorating with such ornamentation as seems the natural completion of the object towards beauty."—R. G. Hatton.

T is often taken for granted that a design for reproduction may be reduced or enlarged to fill almost any space, so long as the relative proportions of length and breadth remain unchanged. It would seem that the process of reproduction being a facsimile process, the design once in hand may be reduced to suit the convenience of the occasion without materially affecting any question of proportion. Now and then instructions something like the following are given: "Make your design of such and such proportions of length and breadth, and I can reduce it to whatever size I wish."

Supposing a design is made for use on the title-page of a book; it is given another reduction and used as a bit of ornament at the end of a chapter; then it suffers still further reduction for use with an initial letter. Would these various reproductions

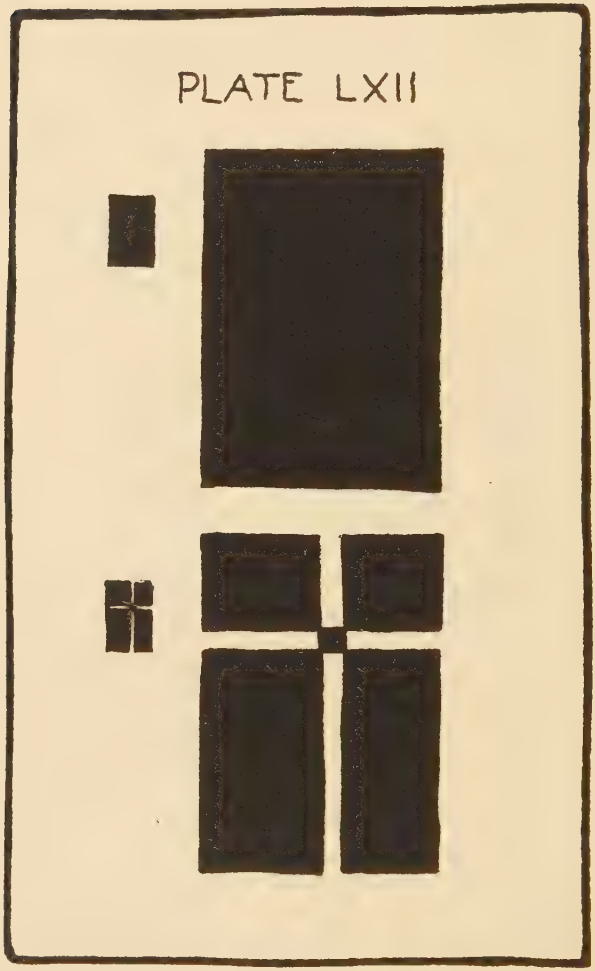


PLATE LXII

have equal merit? Apparently, and yet there is an important point that has escaped consideration.

To make the point clear, let us experiment with one or two definite examples. In Plate LXII is a spot of black, a little rectangle of pleasing proportions, not at all offensive. But when this spot is mechanically enlarged ten or twenty times its blackness and barrenness stare us out of countenance. As the spot grows larger it becomes necessary to increase its distance from the eye in a corresponding ratio. But the page of a book is not intended to be removed to a distance in order that the designer may gain some desired effect. The distance of the page from the eye is a fixed proposition, hence, if we are to retain an interest in that spot, it becomes necessary to resort to a subdivision of the space. This new arrangement once more becomes interesting because, as with the first spot, the distance from the eye has been duly considered. Now, supposing this result is reduced once more to the size of the original spot, we find that our work has been misplaced. The final result is petty and uninteresting; it is a relief to return to the starting-point. Thus, if the distance from the eye is to remain unchanged, any reduction or enlargement of a design becomes a matter for serious study. It is wrong to assume that a facsimile reproduction of a design will retain all the virtues of the original. To call upon a man to make a design for reproduction without acquainting him with the exact requirements of the problem, as regards the amount of reduction, the space to be filled, etc., is very much like asking a speaker to address a public meeting without acquainting him with the subject

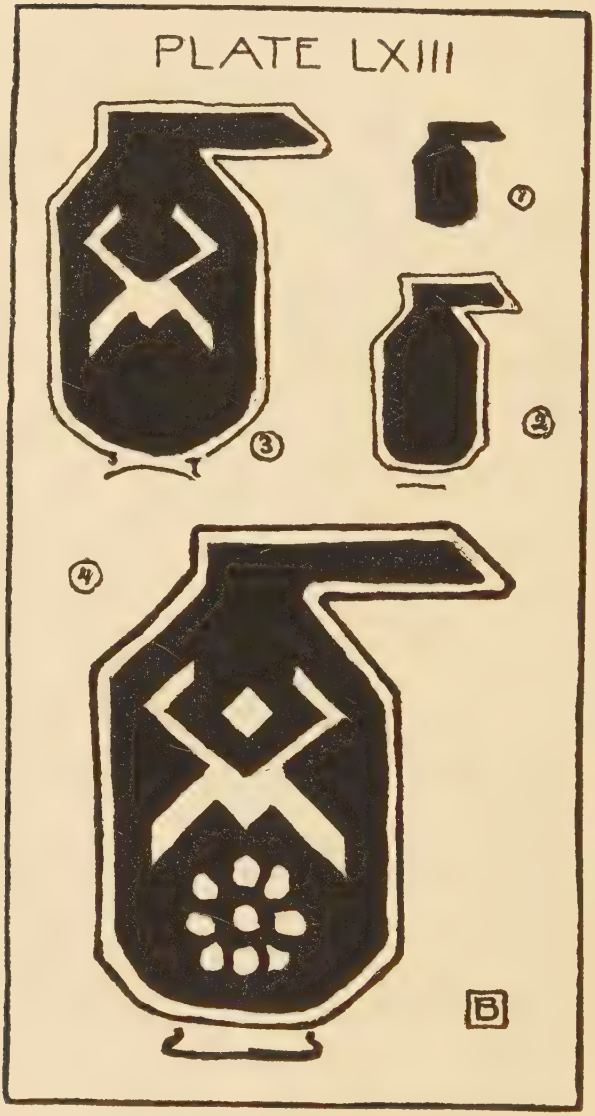


PLATE LXIII
1
2
3
4
B

under discussion — always assuming, of course, that the designer has some regard for his art aside from the merry jingle of dollars.

Let us continue the experiment just made; it may develop into some interesting results. Plate LXIII shows a unit sketched from a Persian rug. The shape of the unit, as it appears in different parts of the rug, undergoes no material change; but the designer knew that to take the small unit, however interesting it might be, and merely increase its measure for use in other parts of his rug, would not bring the desired interest. So with each enlargement of the unit, he resorts to new space divisions; new measure relations are established to meet the changing conditions. Fig. 1 is interesting by itself. Fig. 2 requires the relief offered by the light margin line. In Fig. 3 the black would be overpowering, so it must be cut into new divisions if our interest is to be held. Fig. 4 shows an additional breaking up of the blacks, with an increased measure in the width of the border line in order that this line may afford the same comparative relief that first called for its introduction in Fig. 2. You will readily see that these enlargements might continue until we should eventually arrive at a unit as large as the page of this book, and as the distance from the eye remains unchanged, each enlargement calls for increased care and skill in the subdivision of spaces. Then supposing we were to reduce the largest result obtained back to the original size; all of our work would be lost and we would gladly return to the simple proportions first established in Fig. 1.

PLATE
LXIV

PROBLEM:

Try the experiment for yourself. Take a pleasing spot of simple shape, as in Plate LXIV. Then with a light pencil line, sketch in a series of gradual

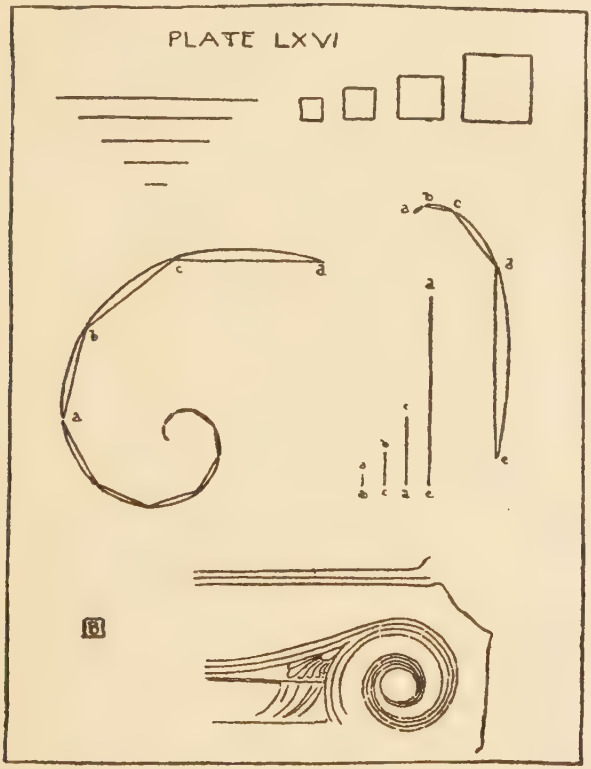
enlargements in which the shape is to remain unchanged, and see if you can take a brush and fill each spot with ink, subdividing the area each time

in such way that none of the original interest will be lost. The distance of the paper from the eye must remain fixed. Then stand the spots in a row before you; if there is one spot in the group that seems weak and inclined to lose itself from sight, or, on the other hand, blankly stares at you and enforces itself upon your attention, you will know that this is the point where you have failed to properly meet the required conditions.

Plate LXV is another version of the same problem; but before trying this step it seems best to briefly explain the next principle that is to take up our attention. Its importance would have demanded definition long ago except from the fact that we have been endeavoring to think of one thing at a time.

Shape rhythm was defined as movement through repetition or interrelation of shapes. Measure rhythm is movement or variation by means of a regular increase or decrease of measures. Drop a stone into the water and as the waves grow larger and larger you have measure rhythm, a movement by means of interrelated measures. This quality is to design what the crescendo and diminuendo are to music. Imagine a music in which there is no tone variation or in which the variation is so sudden as to be unrelated to the other tones. It is measure rhythm that gives the interest to objects seen in perspective. Note a diminishing line of trees; even a row of telegraph poles becomes interesting when seen in perspective. How different the appearance of the elevation of a building, as drawn by the architect, and the perspective of the same building as rendered

by the artist. It is the rhythmic variation of measures that adds much of the additional interest to the latter.



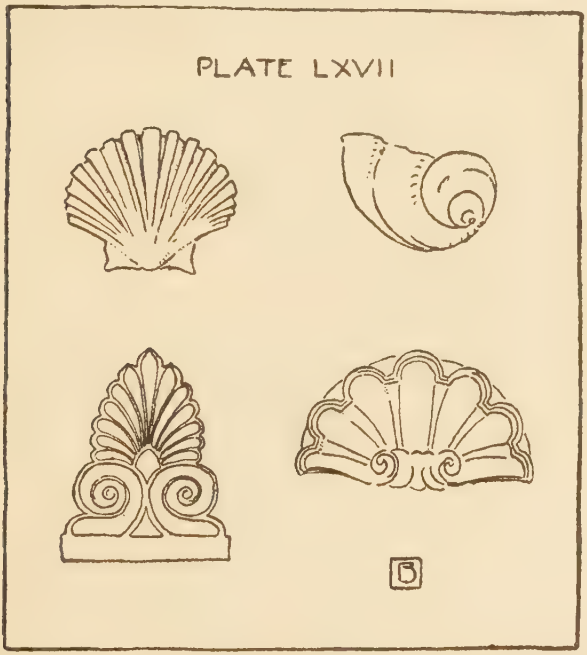
A few examples of measure rhythm as it manifests itself under innumerable conditions may tempt you to keep your eyes and ears open for other illustrations. At the top of Plate LXVI is the abstract idea of measure rhythm, a series of measures related by a decreasing or increasing ratio.

The scroll is one of the simplest and most effective examples of this relation of measures. Mr. Ruskin has explained the matter so clearly that we can do no better than to quote his words: "Take any number of lines, a, b, c, d, e, etc., bearing any fixed proportion to each other. In these examples b-c is one-third longer than a-b, and c-d than b-c, etc. Arrange them in succession, keeping the inclination or angle which each makes with the preceding always the same. Then a curve drawn through the extremities of the lines will be a beautiful curve; for it is governed by consistent laws; every part of it is connected by those laws with every other, yet every part is different from every other; and the mode of its construction implies the possibility of its continuation to infinity; it would never return upon itself though prolonged forever." In accordance with this, Mr. Ruskin calls curves of such character infinite curves, while the circle and such other curves as lack this rhythmic variation of measures he terms finite curves. It is the infinite curve that dominates in nature — in the unfolding of leaves and flowers, in tendrils and vines, in the goldenrod, in the waterfall, in the swimming of the fish and in the shells on the beach. In fact, we are told that wherever nature wishes to express beauty, she resorts to this curve of infinity.

Plate LXVII shows two shells in which the rhythmic measure divisions are noticeable; also two forms in which the same idea is adapted to an ornamental purpose. The shells may or may not have suggested the resulting forms; the fact that concerns us is the appearance of these related measures in nature and art.

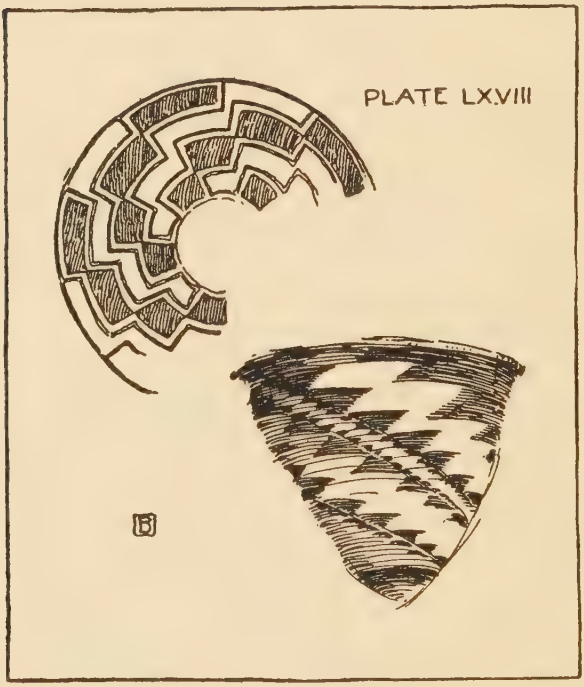
MEASURE RHYTHM

The Indians have always made effective use of measure rhythm in their baskets, blankets and pottery. Two examples of basketwork are shown in Plate LXVIII. Here the movement is vigorous and unmistakable. To appreciate the perfection of such designs as these we have but to compare a few



examples of Indian work with the paltry, unimaginative productions of our own amateur basket weavers. Surely it is unaccountable that even an Indian should display a keener feeling for consistency and unity in design than we, who calmly profess to have attained to a more advanced state of culture.

Plate LXIX is an old colonial high-boy that has stood for a century and a half in a New England garret. The rhythmic relation of the measures from the top to the floor is apparent; and here, too, is an illustration of the idea brought out in the first few paragraphs of this chapter. The lower drawer, unless



subdivided, would present a blank, uninteresting space. In reality, it is one large drawer; but in order to relieve its blankness, the designer divided the space into four measures.

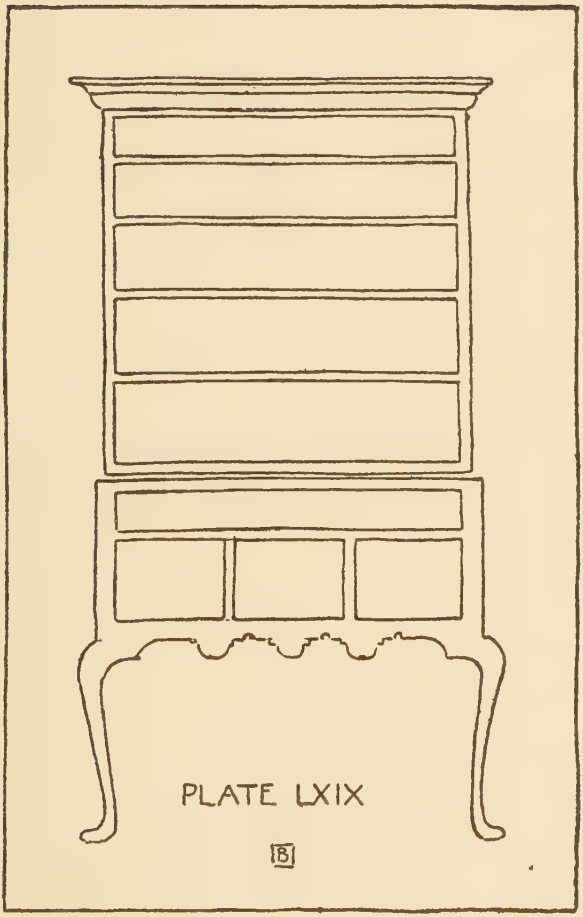
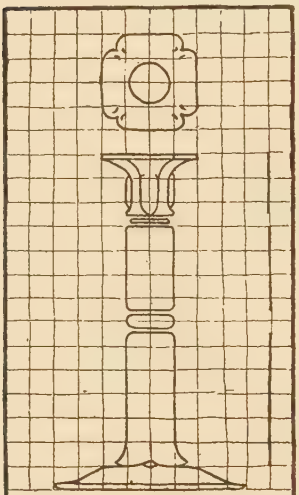


PLATE LXIX

Compare this old piece of furniture with Giotto's Tower, shown in Plate XLVIII. Both are examples of measure rhythm, but they do not both show the increase of measures in the same direction. In Giotto's Tower, the measures increase as the eye ascends; the most important space divisions are at the top. Note the subtle increase in the size of the windows, etc., as the eye progresses upward. This increase of measures gives a loftiness and lightness to the structure by increasing the apparent height. On the other hand the larger measures in the high-boy come at the bottom, which tends to emphasize the appearance of heaviness; in fact, if it were not for the gracefully turned legs, the effect would be one of unpleasant clumsiness, suggestive of something as immovable as the pyramids.



DESIGN FOR A CANDLE STICK SHOWING DEVISION OF THE SPACES FOR MEASURE RHYTHM AND MEASURE HARMONY.

Plate LXX shows an arrangement of spots in which there is a rhythmic decrease of black and white measures from large to small. A study in rhythms it might be called, for the interrelation of shapes and measures carries the eye upward in spite of itself. The skill shown in the subdivision of the large area brings us to the point sought in the following problem.

MEASURE RHYTHM

PROBLEM:

Now to return to Plate LXV. Take a small spot of ink, of pleasing shape, and with light pencil lines, sketch in a series of enlargements of both whites and blacks, similar to the one here shown. As the measures increase in size it will tax your skill to prevent the result from becoming unwieldy and overbearing. Aside from being a study in one of the possibilities of measure rhythm, the effort may be a means of stirring a few latent ideas.

CHAPTER IX.

"No color philosophy will ever teach a man of science to enjoy a beautiful picture, nor a dull painter to invent one."—John Ruskin.

THE "spot of paint" was defined as a tone, a measure, a shape. The work to this point has invclved but two of these terms, measure and shape. Tone rhythm, tone balance (except in its simplest application to black and white) and tone harmony have received little consideration, for by the word tone we imply the use of some medium of expression other than black ink on white paper.

By tone, two things may be meant:

Value — Taking black and white as the extremes of contrast, we may resort to a mixture of these two and obtain a quantity of intermediate tones. These tones may be called lights, darks, high lights, etc., according to their relative values as compared with black or white.

Color — As red, blue, green, etc., according to the resemblance the tone bears to some color found in the spectrum.

It will simplify matters to eliminate, for a time, the question of color and devote ourselves entirely to the subject of values.

Rood says, in one of his text-books on color: "The power to perceive color is not one of the most indispensable endowments of our race; deprived of its possession, we should be able not only to exist, but to attain a high state of intellectual and esthetic culture. Eyes gifted with merely a sense for light and shade would answer quite well for most practical purposes, and they would still reveal to us in the material universe an amount of beauty far transcending our capacity for reception." It is difficult for us to imagine such a world; we are so used to associating color with form that the very thought of losing our color perception is beyond comprehension; and yet, if we are to understand the color combinations about us, and intelligently use them for our own ends, it is essential that we should approach the subject in an orderly way by a study of "the world of light and shade." Unless we know the meaning of the word value, and all the possibilities it opens to the designer, we are certainly unprepared to talk about the question of color.

If black and white are mixed, the result will be a neutral tone, commonly called gray. By neutral is meant a tone that is unaffected by any color. A neutral possesses but one quality: value—its distance from black or white. Charcoal gray paint, water color, approaches more closely to an exact neutral than any other available material. With this paint you can produce a deep, rich black, and, allowing the paper for white, all the intermediate values may be obtained by adding water to the paint. The india ink, when mixed with water, verges too much upon a brown tone to be acceptable as a neutral.

Place two or three brushfuls of water in a dish and by the gradual addition of paint you will find yourself able to make, on a piece of paper, all of the possible values between black and white. This gives a scale or gradation of neutrals (Plate LXXI). In this gradation, how many distinct steps or notes do you think it would be possible to distinguish? Examine a photograph or a reproduction of a photograph, and you might assume that the number of steps from black to white is indefinite; but supposing you take a sheet of paper and make upon it a number of little circles or squares; then fill one of them with black, and allow another to remain the tone of the paper for white. You may be surprised to discover the small number of distinct notes that you are able to strike between extremes. It will tax you at first to make as many as nine notes sufficiently different for the eye to discriminate between them. You will certainly have to make a large number of trials before it is possible to strike as many as fifteen or twenty notes from black to white, inclusive.

This, then, serves to bring the first question of tone relations from the realm of things uncertain down to such a definite proposition that we are able to grasp the matter.

It is first necessary to place these few values in a consistent order. Make a circle at the bottom of a sheet of paper for black; another at the top for white. Between these let us construct the scale of neutral values. To give unity to this scale it is essential that we establish a keynote. This keynote is the "halftone," a note that is neither dark nor light, because

PLATE LXXI

PLATE LXXIV

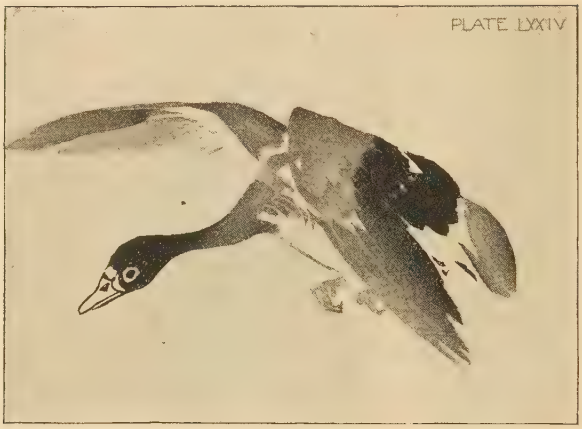
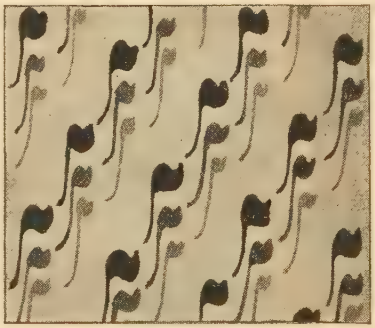


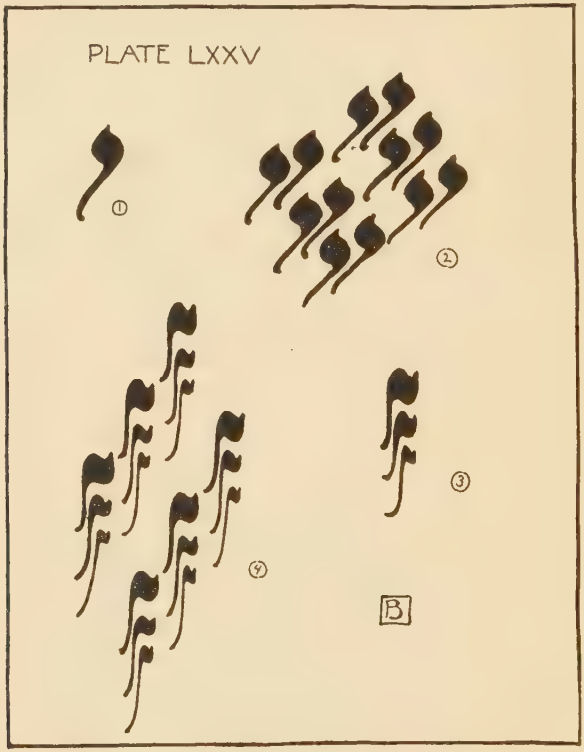
PLATE LXXVI



it contains as much black as white, and when associated with either of these two, presents the same contrast. The keynote is invariable; it must be just right, else the scale will be out of tune. We should be able to recognize this note when we see it, just as we know black from white. In Plate LXXII is a simple test. One of these notes represents the half-tone; the other three must be wrong. Make a few trials similar to this for yourself, and when you feel able to identify the half-tone, construct the scale as in Plate LXXIII, by adding another note between half-tone and black, and a note between half-tone and white. If the scale is properly tuned, the intervals of contrast from value to value will be the same.

This scale gives another type of rhythmic movement, rhythm by means of gradation of values from light to dark or vice versa. The eye will invariably move toward the point of greatest contrast. If the background is white and the gradation is toward black, the eye will unconsciously follow that movement, as in Plate LXXI; the rhythm is downward, for the point of greatest contrast is at the bottom. Note the skilful way in which the Japanese artist has used a value rhythm to aid the flight of his goose in Plate LXXIV. The sketch is typically Japanese, full of life, and spirit, and truth, all told with two or three well-chosen brush strokes. The contrasts are so arranged that we are bound to move with the goose, whether we wish to or not.

Three different kinds of rhythm have now been explained and illustrated; shape rhythm, measure rhythm, and tone rhythm. A direct comparison of the three may serve to fix them in mind.

In Plate LXXV, Fig. 1 is a spot of paint that stands for shape rhythm, because it suggests movement by means of related contour lines. This movement may be increased by a repetition of the

shape (Fig. 2), for not only will each shape be rhythmic, but the interrelation of shapes will add force to the movement first started. We may go another step and add measure rhythm (Fig. 3). This result, when repeated, will still further increase

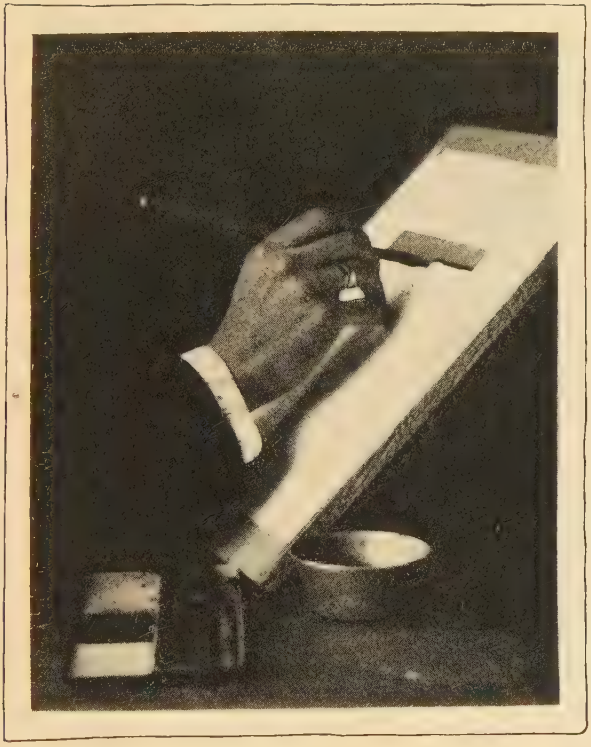
the movement (Fig. 4). And now we have found another way to put life and action into a piece of work by means of tone gradation, which, if added to the result already gained, affords an instance in which rhythm is carried to a logical conclusion (Plate LXXVI). Here we have tones, measures, shapes, all rhythmically related, all "pulling together."

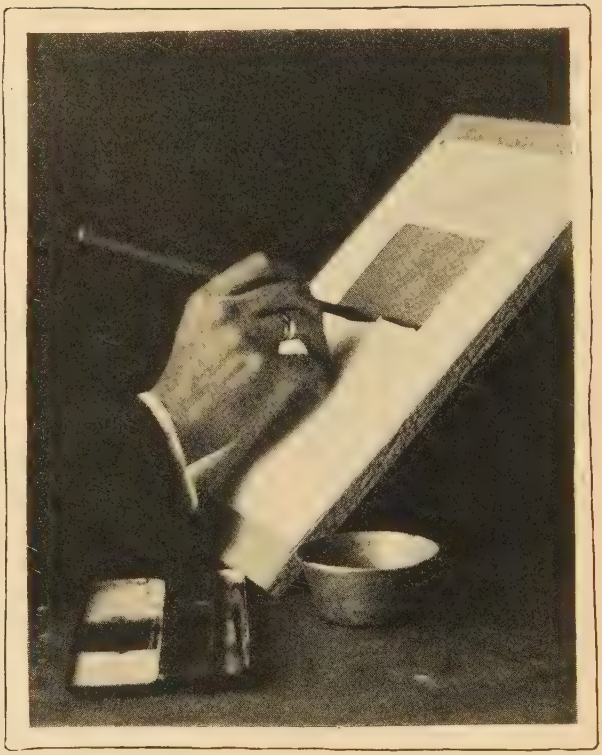
CHAPTER X.

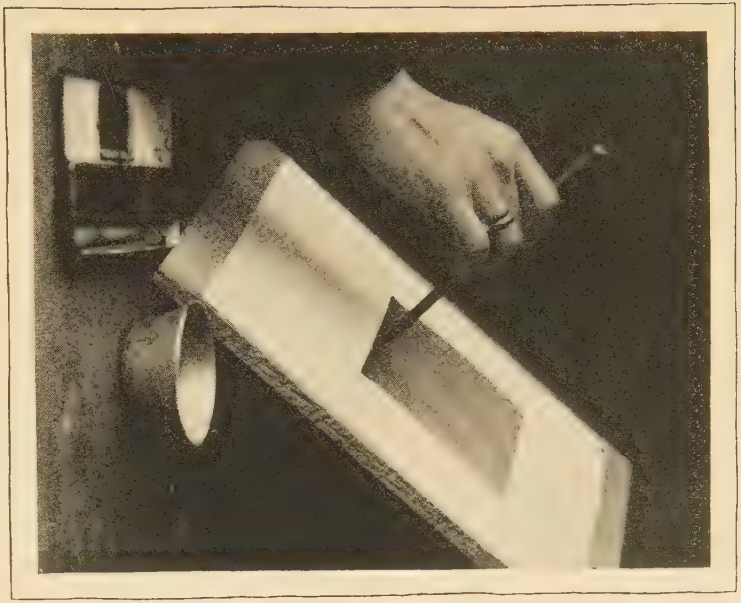
"Let it be remembered, however, that no rigid rules as of cast iron should be allowed to trammel the imagination of the artist to whom there are many things more important than rules, such as observation, knowledge, and experiment; a cultivated taste, sound judgment and a light fancy; an appreciation of what is meant by balance, distribution, and reticence of tone."

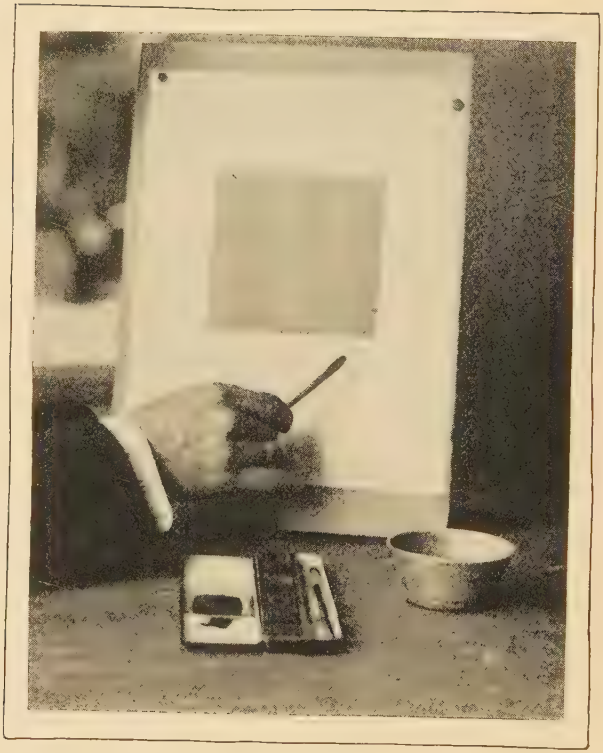
—A. H. Church.

THE use of tones of gray or of color demands more technical skill, a more rapid, though careful, handling of materials, than the use of black alone. One's mind must be alert to the effect of the different values when contrasted with white paper or when placed in juxtaposition. Water color has been chosen as the medium of expression, because it is the cheapest, simplest material to be obtained, and presents fewer difficulties to be overcome than any other medium. It is well at this point, though, to anticipate one or two of the difficulties that may arise to any worker unfamiliar with this material. Let us assume that the scale of five values has been made. You wish now to spread a clear, flat wash of one of these values, the half-tone, for instance, over a four-inch square.









Place eight or ten brushfuls of water in a clean saucer, or in the tray of a water-color pan. Then, with the brush add charcoal gray paint until you feel convinced that the tone is dark enough. Try it on a scrap of paper and compare the result with the half-tone note of the scale. This brings you to the first difficulty. Allowance must be made for the fact that water colors always appear lighter when dry than when wet. The amount of allowance must be determined by experiments. Allow the trial tone to dry and beside it place a fresh stroke of the brush. By a few such comparisons you will be able to determine for yourself the necessary allowance for drying. When the half-tone has been obtained, proceed to lay the wash as shown in the accompanying photographs. With the paper inclined, fill the brush and draw it lightly across the square, fitting the paint snugly against the top line. This should leave a little ridge of paint at the bottom of the stroke. The only care now is to keep this ridge of paint moving down the paper by repeating the first operation. Keep the brush well filled ; dip it with each new stroke, and fit the wash carefully against the side lines as you proceed, for you must not, under any circumstances, go back to repair damages. When the bottom of the square has been reached, the moisture must be pinched from the brush and the ridge of paint carefully lifted from the paper. This should leave a square as clear and unspotted as the paper itself. In no other way can a flat wash, suitable for use in designing, be obtained with water colors.

Now for the question of tone relations. When we speak of tones we refer always to contrasts. The

Black-white.	Dark-light.
Black-light.	Dark-half.
Black-half.	Half-white.
Black-dark.	Half-light.
Dark-white.	Light-white.

Now compare this plate with the scale of neutrals and you will observe that there is one instance, black-white, in which the contrast is of four intervals. This is our loudest, strongest combination. In the row below this are two instances in which the tones are separated by three intervals. In the next lower row the contrasts are still further decreased so that there are but two intervals between tones. In the bottom row are four instances in which there is but a single interval of contrast. These give us the P P or "soft pedal."

Harmony was defined as "having something in common ; consistency of likeness ; reconciliation of differences." According to this definition, then, the contrasts in the bottom row are most harmonious because, as values, they have most in common; they stand side by side in the scale, being thus closely related in tone. As the interval of contrast increases in the row above, the tones have less in common and are, consequently, less harmonious. The difference may seem a matter of small concern; but when we come to the point of translating these values into colors we shall find that the slightest change in the interval of contrast becomes a matter of supreme importance. In the next row above, the tones have even less in common, while the black and white of the top row have nothing, as values, in common, and hence form the least harmonious combination.

Black and white inharmonious! Even so; despite the fact that masses of black and white give a certain brilliancy and richness to a piece of work, the result is generally harsh from the tone point of view. The nearer we come to a balance of two tones, the less desirable this strong contrast becomes. If the blacks are broken, as on the printed page of a book, by the intermixture of whites, a tone of gray is produced which affects the eye just the same as the grays of our scale. In fact, we can duplicate our ten contrasts with type if we choose, just as has been done with lines in Plate LXXX.

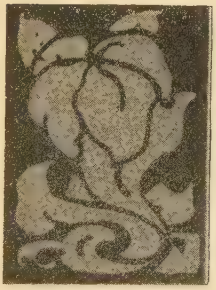
Plate LXXVIII is a graphic illustration showing the different degrees of contrast from the "loudest" to the "softest." As the tones of the design are nearly equal in quantity, the strong contrast of black and white is much less desirable than in the instances where the interval between values has been decreased. Though the quantity of the tone does not affect the question of contrast, it does materially affect the appearance of a design, as we shall find later on. In fact, if we were not averse to giving rules, we might say that as the quantity or measure of a spot decreases, its contrast should increase; what it lacks in size may be made up in contrast.

In Plate LXXIX the contrasts remain the same as in the previous plate. Whether the unit shall be dark against light or vice versa depends entirely upon the requirements of each individual design. In the present case it is purely a matter of personal choice. The tones in these plates have been reversed in order to show a still wider range of possibilities to be found in those five simple notes, a little reed

PLATE LXXVIII

B – W.

B – L



B – H.

B – D.

PLATE LXXIX

B — W.

B — L.

B — H.

B — D.

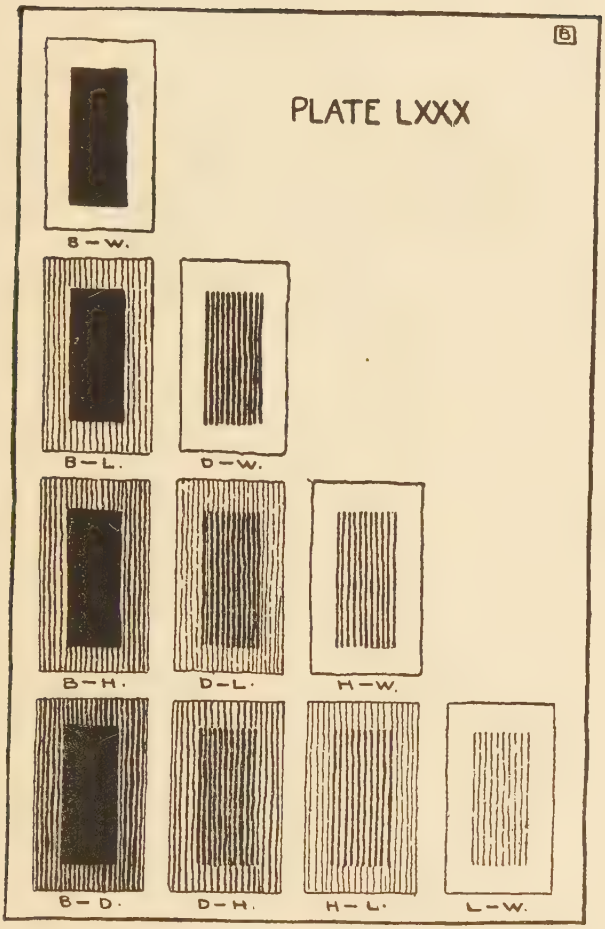


PLATE LXXX
B—W.
B—L.
D—W.
B—H.
D—L.
H—W.
B—D.
D—H.
H—L.
L—W.

flute, as it were! If a designer were limited to those notes alone he would never lack means of expression. In fact, if printers were limited to those contrasts, as in Plate LXXX, and would experiment with the results, aiming to acquire complete control of a few tones rather than depending upon the uncertain effects of unrelated tones, we feel convinced that the art of printing would not suffer. How often we find good work marred by a misplaced contrast, a type that strikes the note light associated with an initial that strikes the note black — a contrast of B-L, inharmonious on nearly every occasion. Plate LXXXI illustrates the point.

PLATE LXXXI

HEN we wish to play upon a musical instrument we must have a definite scale with related intervals of sound. This scale, with its simplest combinations, must first be mastered before we can ever expect to intelligently arrange a musical composition. Why should we not follow the same process in colorwork, instead of depending upon the uncertainties of a personal whim? Color, after all, is but music to the eye.

H—L

E may have in color, as in music, a scale of definite intervals upon which to play. If we resolve each note of a neutral scale into a color spectrum, all the possible colors between the extremes of black and white will result. With this instrument as a basis for study, it will be found that the principles of design are applicable to colors as well as to lines and areas.

B—L

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B—L

CHAPTER XI.

"And so to the perfection of beauty in lines, or colors, or forms, or masses, or multitudes, the appearance of some species of unity is in the most determined sense of the word essential."—John Ruskin.

IT was shown that there were ten combinations of two tones each in the scale of five neutrals. There are likewise ten three-tone combinations at our command. To any one who has gained sufficient control of the instrument to strike a contrast of two related notes, a few experiments with three-tone compositions will suggest a much wider range of possibilities. An exhaustive series of experiments with these ten three-tone arrangements leads one to the conclusion that they are not equally serviceable. The first three plates accompanying this chapter show some of the results of this work. A comparison of the two figures in Plate LXXXII gives all the advantage to the second example. In both figures the same three tones—black, white and half-tone—have been used. But while the first is harsh in its contrast of black and white, the second is a pleasing composition. In the second there is a balance of three tones; in the first the element

of balance is missing. Tone balance means the use of three or more tones, separated by equal contrast intervals. In Fig. 1 the contrast of black-white is so great that the contrast of white-half has not sufficient force to attract its share of attention. The flower has been unduly emphasized at the expense of the leaves; the unity suffers because we are unable to grasp the result as a whole. In Fig. 2 the half-tone has been chosen for the background, and this makes the contrasts equal; black-half, two intervals toward the dark end of the scale, is balanced by white-half, two intervals toward the light end of the scale. In other words, the attractive forces of black and white are the same on a half-tone ground.

If we have a design in which it seems desirable to emphasize some particular feature, the first illustration might prove acceptable. But the occasions when these unequal contrasts are desirable do not occur as often as the occasions when a carefully balanced tone arrangement will prove best. If you will observe three tone designs and compare those in which the idea of tone balance has been ignored with those in which the contrasts have been equalized, you will find innumerable examples in which improvement is possible.

Now let us compare all six of the illustrations shown in the first three plates from the point of view of tone balance and tone harmony. Plate LXXXII, Fig. 1, lacks balance, as we have seen. It lacks harmony because the contrasts have not enough in common. Fig. 2 has balance because the attractive forces are equal. It has more of harmony because the half-tone serves as a common ground on which the

contrasts may "reconcile their differences." Fig. 3 is a better harmony because the tones are brought into still closer relations; the balance also remains. But in Fig. 4 the wrong tone has again been chosen for the background and the balance is destroyed. The same applies to Fig. 5; it is more agreeable than Fig. 1, even though it is unbalanced, because it is more harmonious. But by once more equalizing the attractive forces we have a better expression of the subject in Fig. 6. And so, of the fourteen tone schemes through which this little sketch has passed, we will choose Figs. 2, 3 and 6 as the most satisfactory; they illustrate the unity that will be found in any design in which balance and harmony of tones have been properly considered.

But there is another proposition that entered into the making of this design, and to this question we are now prepared to turn.

It is necessary to recall your attention to Chapter III, in which a demonstration was given of measure balance as applied to forces of black and white. The same law must enter into a composition in which tones other than black and white are involved. As a result of those demonstrations the following law was stated:

"Equal measures of equal contrasts will balance at a point midway on a line connecting the centers of the measures."

"Unequal measures of equal contrasts will balance on a line connecting the centers at distances that will be in inverse ratio to the measures."

Now it becomes necessary to understand the application of this law to measures in which the con-

PLATE LXXXII

(1)

(2)

PLATE LXXXIII

(3)

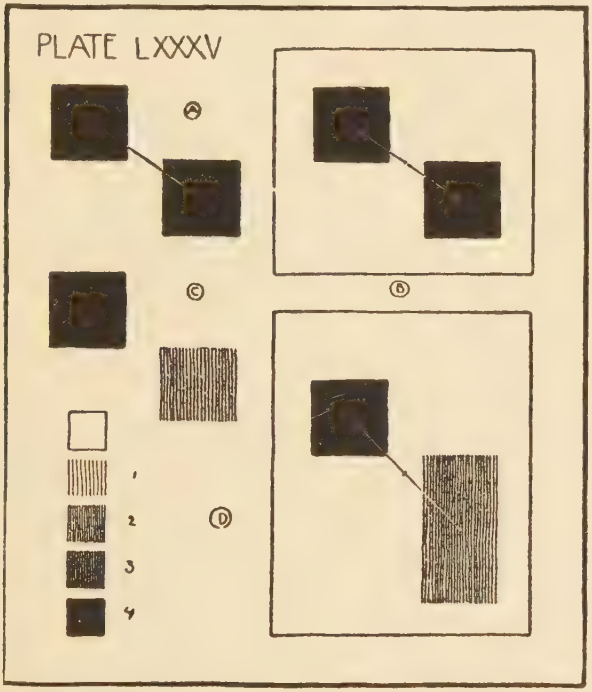
(4)

PLATE LXXXIV

(5)

(6)

trasts are unequal, in order to strike a consistent balance of all the elements that enter into the making of a picture or a design.



In Plate LXXXV (A) are two measures of black. They will balance at a point midway on the line connecting centers, as in B. Now, supposing we change one of the contrasts to the half-tone, as in C; it is apparent that the two forces are not equal in attraction. If we still wish to balance them at a point midway on a line connecting centers, it becomes necessary to double the quantity of the lesser tone,

as in D. The truth of the statement is evident; but what is the law on which it is based? A glance at the little scale will show that, with white as a background, there are four contrasts. "The force of a spot of paint is its measure multiplied by its contrast." In D the measure of black may be represented by 1; its contrast is 4; the product is 4, which is the attractive force of the black spot. The measure of the gray spot may be represented by 2; its contrast is 2; the product is 4, the attractive force of the gray spot. Thus, as the attractive forces are equal, the spots will balance at a point midway on a line connecting centers.

Now, supposing D is taken and the black spot is changed to light; how can the balance be secured? The conditions of the problem are different; but the same law applies. Here is the statement — work it out for yourself. The measure of light is 1; its contrast is 1; the product is 1, the attractive force of the light spot. The measure of the half-tone is 2; its contrast is 2; the product is 4, the force of the half-tone spot. It is necessary, then, to divide the line connecting centers into five parts, four for the light and one for the half-tone. If the point thus gained is made the center of an enclosing form, a proper balance of attractions will be secured.

Let us balance three spots in which both measures and contrasts are unequal, as in Plate LXXXVI. The measure of the dark spot is 1; its contrast is 3; the product is 3, the attractive force of the dark spot. The measure of the black spot is 2; its contrast is 4; the product is 8, the attractive force of the black spot. The measure of

PLATE LXXXVI

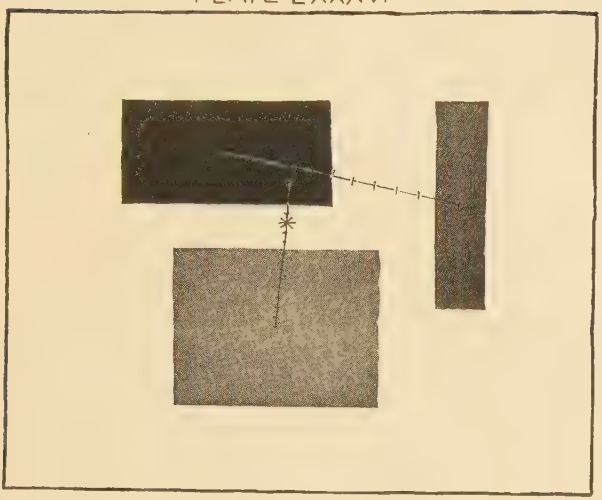
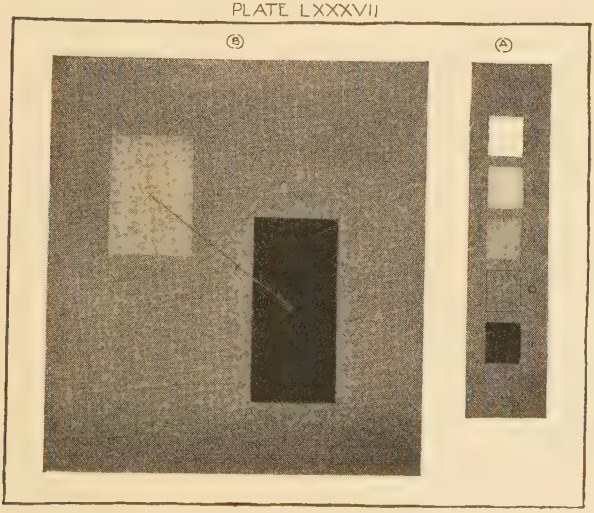


PLATE LXXXVII



the half-tone spot is 3; its contrast is 2; the product is 6, the force of the half-tone spot. Here, then, are three forces to be balanced. The attraction of each spot is represented by the figures:

3 for the dark;
8 for the black;
6 for the half-tone.

We will balance dark and black first; then balance these two with the half-tone. On a line connecting the centers of the first two spots, eleven spaces must be made, eight for dark, the lesser attraction, and three for black, the greater attraction. Now, to find the balance-point of all three spots, the first two must be balanced with the remaining half-tone. The ratio here is eleven to six. The half-tone requires eleven parts of the line; the other two tones need but six parts. This point becomes the center of the enclosing form.

If you will work out the process through one more illustration, the law should then be sufficiently demonstrated.

In Plate LXXXVII is a spot of half-tone and a spot of black to be balanced on a dark background. With dark as a background, the intervals of contrast are as shown in A. In B the measure of the half-tone is 2; its contrast is 1; the product is 2, the force of the spot. The measure of the black spot is 3; its contrast is 1; the product is 3, the force of the spot. Their relative attractions then are as two to three. To balance on a line connecting centers the half-tone spot must have three parts, the black spot two parts.

PROBLEM:

With the above examples as a basis, solve these problems:

Balance one measure of black with three measures of half-tone, on a white background.

Balance two measures of dark with five measures of half-tone, on a white background.

Balance one measure of black with two measures of light and one measure of dark, on a white background.

Balance two measures of dark with three measures of white, on a half-tone background.

If you can do these problems you will know the law of balance and will understand the why and wherefore of one of the things that counts for unity in the composition of masses.

The three accompanying plates are illustrations of balance and harmony of contrasts, as applied to a bit of representation. It is always an interesting problem to take some little sketch and use it as a basis for a two, three or five tone arrangement, endeavoring to gain a consistent balance of the various attractive forces. Mathematics will not help you here; it is a test of the judgment acquired by experience. It is very much like learning to read; the grammar and the dictionary are useful beyond doubt, but it is not until you can get along without them that you are able to read.

PLATE LXXXIX

PLATE XC

PLATE LXXXVIII

CHAPTER XII.

"In Nature, beauty and structure are interwoven: the two are inseparable. And so in design, the decoration must grow up with the structure."—R. G. Hatton.

WE have taken a detailed survey of some of the more important manifestations of the three principles of design; a grammar or dictionary of the subject has been presented, a rudimentary study of certain fundamental laws, in order that a logical reason may appear for steps that are too often taken without adequate definition. We are now ready to put our principles to the test of practice.

Mr. Ruskin has said: "Drawing may be taught by tutors; but design, only by heaven." In other words, a pupil may be led to observe what is placed before him and may be taught to make an adequate representation of that object; but no instruction can equip a pupil with the imagination and invention that must necessarily enter into the making of a design. The invention may be stimulated in a certain measure by such exercises as have been given; and, by working out one thought at a time the pupil may find it possible to produce, often much to his own surprise and pleasure, arrangements of lines and

masses quite distinctive in character, possessing much of interest and beauty, elementary though they may be. Not only this, but he will have prepared a sound basis on which to build and will have acquired the habit of thinking in lines and masses, in tones, measures and shapes.

PLATE XCI

There are many workers who can draw the figure, sketch from nature, paint from still life; but it is quite a different problem to compose these things within a given shape — to take a leaf or flower for purposes of decoration, in which beauty and grace of line, mass and proportion must take the place of

the transient lights, shades and colors of nature. Take, for example, Plate XCI, a line composition from the Japanese. Here is a swirl of water, a little tangle of reeds, a mass of foam from which a fish leaps the falls. How simple in execution, yet how complete as a design! The test of its excellence must be sought in the relation of lines, shapes and measures; failing here it fails as design. Back of this little sketch there must have been an intimate acquaintance with fishes and with running water, a thorough understanding of the principles of composition, and a keen, sensitive imagination. Set yourself a similar task and you will realize the part that invention and imagination play in the final result. It may have required days and weeks of study to produce this simplification; but the result appears to be free and spontaneous. No design can be considered as satisfactory until all traces of the persistent study and work that entered into its preparation have been removed. The designer must be a man of ideas, able through constant practice to express himself with apparent freedom.

In these concluding chapters it is our purpose to bring the purely abstract work that has been done into a closer relation with nature, and suggest a line of work that may lead the student to seek in nature the ideas that may help him most in design. Lacking a sympathetic study of nature, one's imagination will soon run to dry channels.

Let us approach the subject from two points of view; first we will proceed from the abstract toward nature, then from nature back toward the abstract. Somewhere on the borderland between the two

PLATE XCII

extremes the designer will find the field best adapted to his own work.

Fig. 1 is a design from the Greek. What is it? Was the start from nature or from the abstract? Did the designer take some natural specimen in hand, determined to use it for a decorative purpose,

Fig. 1.

or did he start with the idea of developing an arrangement of lines, and arrive at a result suggesting nature? It is sometimes known as the "honeysuckle border." But who can say that the honeysuckle suggested the start? It seems best to believe that the abstract and nature may both have had an influence in shaping the final result. The two points of view are further shown in Plates XCII and XCIII. In the first illustration the aim was to produce a well-balanced arrangement of spots, carefully studied as regards line and mass, proportioned to fill a given space. It suggests rabbit; yet there is very little of the rabbit there after all. He is an incident, a bit of invention; a slight rearrangement of the spots and he will disappear, without materially affecting the problem as stated. In the second example though, the rabbit is the

feature. He was studied with the avowed intention of using him for a decorative purpose. Certain liberties have been taken, detail has been ignored; but he must still be a well-constructed rabbit, else the design is a failure. While invention enters into both results, the start was not from the same point of view.

PLATE XCIII

In Plate XCIV is another example in which lines, spots and tones are of first consideration. It was not the intention to immortalize a rooster. The suggestion of fowl is a pleasing bit of fiction. If the lines are rhythmic, the tones and measures well balanced, the idea with which the problem

PLATE XCIV

PLATE XCV

1

2

3

4

(B)

started has been fulfilled. The little touch of imagination merely serves to increase the interest.

If you wish to make a rigid application of the principles in the light of the demonstrations that have been given, you will find all these results equal to the test, though the adherence to sound laws has now become unconscious, a part of one's nature, as it must always be in effective work. One can not think out a design and be occupied with the scientific demonstration of a principle at the same time. But, with the exception of Plate XCIII, all the work here shown partakes of the same abstract character. Each result may be treated as an attempt at space filling with elementary lines and masses; it is simply a step in advance of the elementary work we have been doing.

PROBLEM:

As a starting point, take Plate XCV. Here, in Fig. 1, with free pencil play, a rhythmic movement was started, felt out, not drawn rigidly and mechanically; as lines and spots began to develop, care was taken to balance them in preparation for a three-tone composition. Then, when the movement seemed right, when the proportions were satisfactory, a tracing was made and the tone balance completed the result.

Now, it was precisely this process that was followed in the other results, but with a finer, more sensitive play of imagination, greater invention and, withal, no small amount of stick-to-it-iveness until the lines gradually assumed relations that accorded with the idea in mind. It is purely a mental process; the pencil and brush form the least

important part of the equipment. Just think and your pencil will follow you; if it does not it is your thinking that is wrong. As a next step, try something similar to Fig. 2. Feel for two or three big main lines first of all. It is not necessary to enslave yourself to a main line; it may be shifted and changed at will, like the other lines. But unless there is some well-related movement established first, confusion may result. It serves to bring the details of a design into unity. The development from this point to the plates following may come from practice — and practice continued — never with the idea of simulating any particular specimen of natural growth; always with the idea of bringing additional interest into what might otherwise be a purely elementary arrangement of tones, measures and shapes.

Whether we approach nature or remain close to the abstract, one point must never be forgotten. We must be consistent; each part of the design must be related in character to all the other parts. In Plate XCVI, for instance, there are stems, leaves and flowers; but they are equally abstract. The moment any detail departs from the abstract and draws closer to nature, the consistency of the whole is destroyed. To depict some familiar flower on those stems, associated with those leaves, would destroy the unity of the result. The point seems obvious; yet it is so often violated, realistic details are so thoughtlessly mingled with other features that are purely elementary in character, that the point needs constant emphasis. It leads one back to an assertion made in the first chapter, that with

PLATE XCVI

all his imagination and invention, the designer requires a fund of wholesome common sense.

In Plate XCVI you will find that the spots, as measures, balance at the center of the composition; the center of the rectangle coincides with the balance point of the measures, though here, unlike the demonstration as given some time ago, the principle follows as proof of good composition.

PLATE XCVII

In Plate XCVII the main lines are readily seen; all lines conform to the enclosing circle. This rhythmic movement "leads the eye through all the details of the design." In Plate XCVIII the balance of two

PLATE XCVIII

PLATE C

contrasts on a middle ground is secured without changing the conditions of the problem.

In Plate XCIX, with the simplest possible movement, the whites and blacks are not only balanced as tones, but as measures they also hold the eye at rest at the center. Rhythm may enter into any arrangement; but rhythm without balance is a step toward "mob rule." Imagination may run riot into rhythmic lines; but unless the restraint of balance is present, confusion and a feeling of unrest will result. Movement and repose must always be associated.

In Plate C the shapes have been balanced into a symmetrical composition, and all without yet venturing beyond the possibilities of abstract design.

the task of the designer is the conventionalization of natural forms, laying far greater stress upon this point than upon the consideration of line and mass in the abstract, which, indeed, must always be the test of a design, whether naturalistic or geometrical in character. Without a thorough knowledge of the fundamental principles governing line and area composition, the student's mind is unprepared to receive the suggestions nature has to offer, and his study of her often becomes a dull matter, unsympathetic to the last degree.

We may presume that by this time something is known about the various manifestations of the principles of line and area composition. Let us now turn to nature with a series of exercises that may serve to bring the work into closer touch with the life about us, and at the same time offer a most helpful line of work for a continued study of elementary principles. We will be frankly naturalistic in treatment here. The first aim will be for an expression of the spirit and character of some natural growth; then we will think of the result as lines and masses to be composed within rectangles.

As an example, examine Plate CI, a study of one of several weeds and flowers brought home as the result of an hour's ramble in the woods and fields. This specimen might have been rendered with all the minuteness of a scientist; but the value of such a study is doubtful at this stage of the work. We have preached the virtue of simplicity, so let us continue the process at this point. Here are dark berries with light stems and leaves. This is enough for our purpose; we will ignore the slight variations

of light and shade, select two values from the scale, and then, within a rectangle suitably proportioned to the specimen, try with clean, crisp brush strokes to render the characteristic features of the plant. A feeling for sound principles will lead us to secure a pleasing arrangement of lines, a cutting of the rectangle into space divisions representing unity with variety, and a balance of the various forces of black, white, and gray at the center.

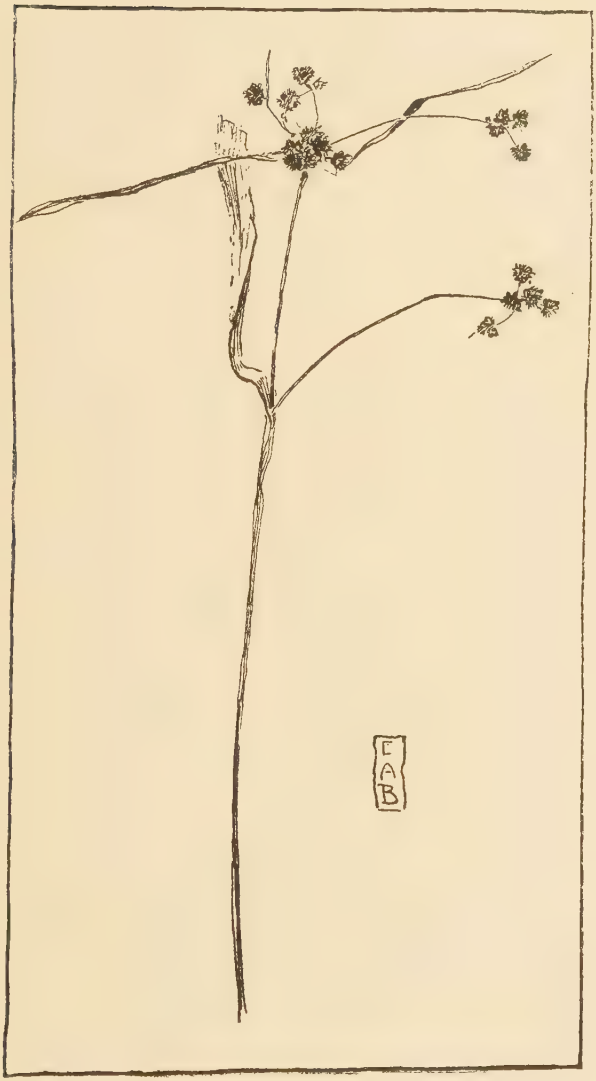
Decorative arrangement seems to be the most appropriate term to apply to such work. The results are by no means mere imitations of nature; nor are they designs, except as we think of them in lines and areas alone. But as the decorative value is entirely dependent upon a proper interpretation of principles, this work may be thought of as the first step to be taken toward the translation of the suggestions offered by nature into the terms of design.

PROBLEM:

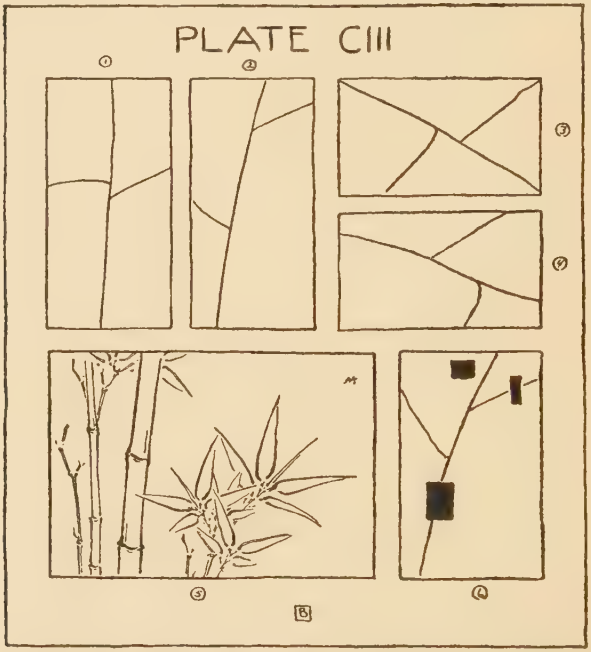
The problem is one that may be varied in many ways, both in materials and in results. As another version of the same idea, take the little pen-and-ink sketch of the sedge shown in Plate CII. With such a simple subject at hand, take a sheet of Japanese paper and divide it into a number of rectangles. By placing these rectangles over the sketch the transparency of the paper makes it possible to select and arrange the lines and areas of each composition according to our individual tastes. Plate CIII shows the simple laws to be observed. The problem necessitates at once a return to the elementary demonstrations given. Compare Figs. 1 and 2 as line arrangements. The first example is unsatisfactory

DECORATIVE ARRANGEMENT

PLATE CII



because the measures and shapes into which the figure is cut are so nearly alike that monotony results. It is unity carried to the point of uniformity. Unity with variety, then, should be the aim, as in Fig. 2. Here the measures and shapes are different, but "the driver is present." There is a gradation of measures from large to small, giving



fully as much unity as in Fig. 1, but far more interest, owing to the variation. Figs. 3 and 4 show that the same idea dominates regardless of the size and shape of the space to be cut. Note the arrangement of lines in the little Japanese sketch below. It is

nature, to be sure, but it is a line composition above all. With the introduction of areas, as in Fig. 6, the problem remains the same ; the main lines must cut the rectangle into agreeable space relations and, in addition to this, a balance of the various elements must be secured.

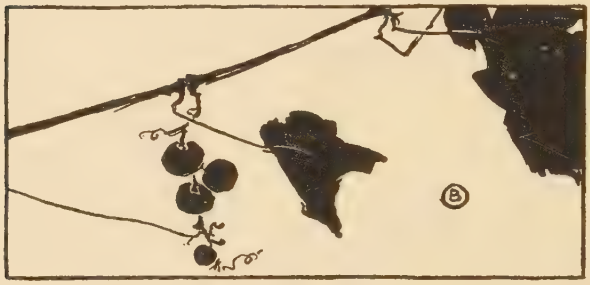
Now apply this to Plate CIV, and, in fact, to the other plates shown, and the idea underlying it will be apparent. The problem may become more complicated, figures and landscapes may enter into the question, but the same eternal, ever simple principles must be sought at the bottom of it all.

Such work as this may never be reducible to dollars and cents in the commercial world. It is possible that the results of such study may never be directly translatable into designs. But the student is selfish to his own interests if he seeks in nature only such material as may serve his immediate purpose in design. It is very easy to forget how to study, how to look at things from the student's point of view; yet this very faculty of knowing how to study beyond immediate requirements is essential to the one who desires to accomplish anything worth while. If you can appreciate and catch something of the grace and beauty of line in a simple wayside weed, nature will yield you more in the way of suggestions for further work, a reserve force, than if you sit down to the joyless task of torturing some gorgeous hothouse flower into conventional lines.

Plates CV and CVI show two treatments of the grape vine, each result, of course, admitting of innumerable variations equally interesting if properly composed within the required space. The drawing

of the plant in each case was in silhouette, free brushwork without preliminary pencil lines. In thus working directly from nature with the brush, you are bound to think of your subject in lines and areas, and the very fact that you are unable to show all

PLATE CV



the little things compels you to select characteristic features and to render these with the directness and simplicity that should enter into all your work. In signing a drawing of this kind your signature or mark, if within the enclosing form, must be considered as a part of the composition. This being the case, it seems best to adopt the plan of the Japanese artist and bring the signature into decorative relation with the other elements.

Plate CVII shows an increased range in the value of such work as this. Black and white is not a harmonious combination. After having found the best possible decorative arrangement of lines and areas, continue the problem by the selection of three or more values from the scale and try to add a balance and harmony of tones. A work of this kind is a confession of just how much you know about

PLATE CIV

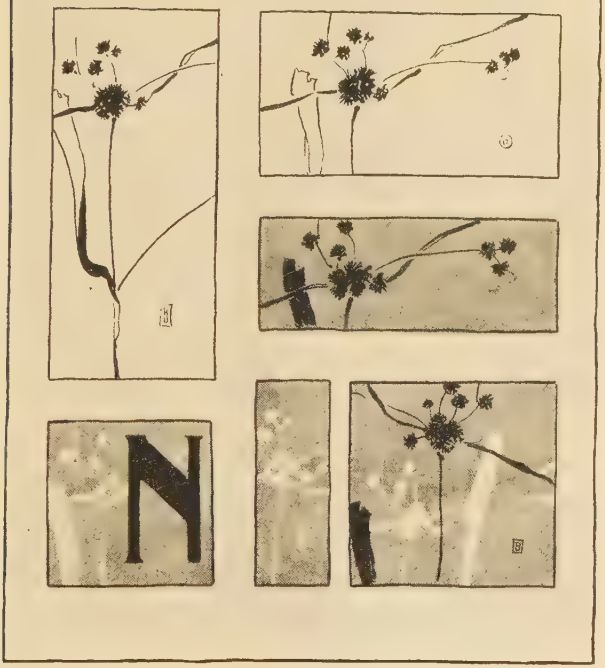


PLATE CVI

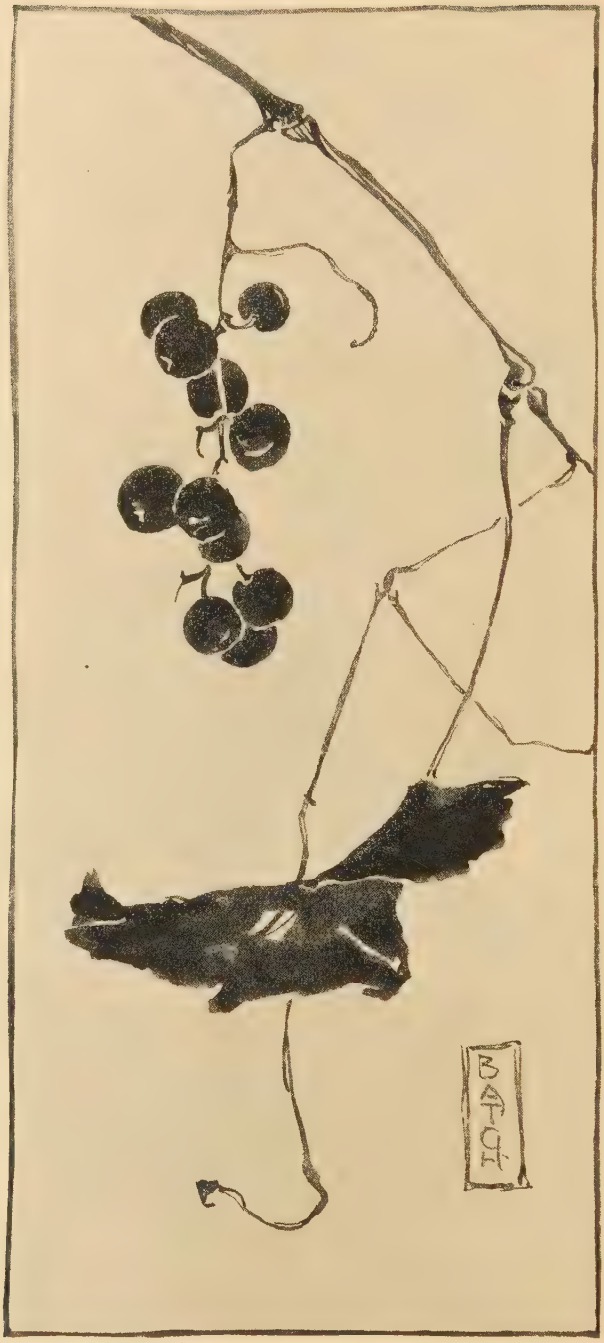


PLATE CVII

PLATE CVIII

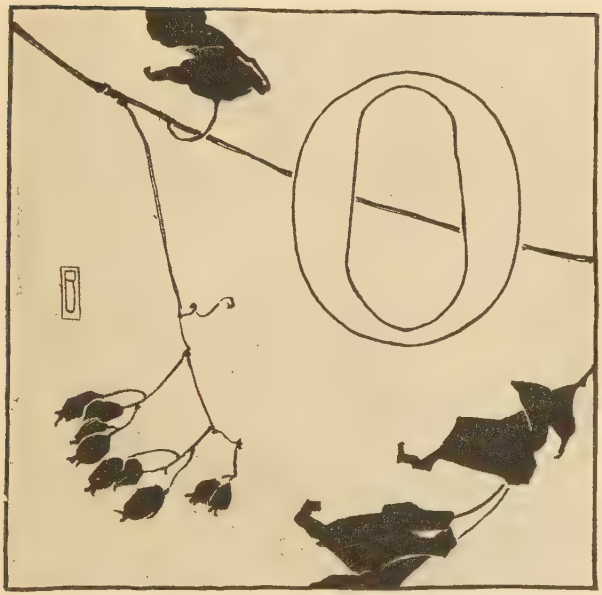


PLATE CIX

the principles of design. If you conceive that the mere placing of a plant form within a rectangle fills the purpose, your need for continued research is boundless. But if you are able to think of a plant form in terms of tones, measures and shapes, you are making commendable progress.

It is even permissible to use work of this kind in the planning of initials, chapter-heads, etc., providing the design has a feeling for consistent decoration. Plates CVIII and CIX illustrate the point. It is necessary to give the letter such position that it may come next the type. With this condition imposed, the problem is not essentially different from the preceding examples. It will be seen that in the last plate the question of tone assumes increased importance. The initial letter being the chief feature, may have attention directed toward it by increasing its contrast.

CHAPTER XIV.

"No matter how much facility of idle seeing a man may have, the step from knowing to doing is rarely taken." — Ralph Waldo Emerson.

ATURE does not offer us a storehouse of ready-made designs. As design is the orderly expression of an idea, the best nature can do is to help us with suggestions. A thoughtful examination of the structure and development of shells, cones, insects, fishes, plant and animal life must make the serious student marvel at the orderliness of things in nature, the disposition and arrangement of parts, the interrelation of lines and areas, the perfect balance for which nature strives. The hand of the master designer is everywhere in evidence. But no matter how orderly nature may be, even to the rigid severity of a crystal, or how shapely in line and mass, or how transiently beautiful in tone, it is not within the province of design to utilize these things without the play of human invention and imagination. We are workers in different materials and under different conditions from those governing nature, and any attempt to reproduce natural forms in wood, clay, iron, on cloth or on paper, is a mistaken effort on

the part of the designer. A sketch of a beautiful flower may possess merit in itself, but it becomes stupidly monotonous when repeated over a surface. An idea is lacking. But by starting with a general scheme in mind and by modifying the sketch, eliminating the accidental features, subordinating the unimportant things, thus making the whole conform to his idea, the designer may achieve something worth while.

The average man, if his interest can be sufficiently aroused to examine the construction of a design based on some natural form will ask: "What is it? A rose or a poppy?" seeking some familiar element of identification, and, failing to find it, the chances are even that his interest will cease. But the only questions one need ask are: "Is it orderly as regards lines and masses? Has it unity from the point of view of tones, measures, shapes?" Possessing these qualities it is entirely immaterial whether your work was "based on the poppy" or on the rose. Either of these flowers might start a train of ideas leading into line and mass arrangements in which the last vestige of identification becomes lost. It is merely necessary to keep in mind the truth, and it will bear repetition for the second or third time, that the closer your design does come to the rose, the more necessary it is that you adhere to the laws of growth found in that flower; but the more abstract your design becomes, the less essential it is that you conform to the characteristic features of the rose.

Let us illustrate the matter with a few sketches. Plate CX shows a waif of a weed — name unknown

— grows in the back yard. Perhaps one would not choose it as being particularly fertile in the way of suggestion; but it is often better discipline to make the best of things just at hand rather than wander afar in search of a motif. Let us do a little thinking with the pencil and see what may develop during the course of a few hours of persistent work. Of course, no rule of procedure can be given, nor can we record a recipe for making designs, as would be possible for making doughnuts. In fact, if the same experiment were tried with this motif at some other time, it is quite probable that results entirely different in character might be obtained. But here are the results, such as they are, of the present effort, some acceptable, others less interesting and less satisfactory.

Let us take Plate CXI as typical of the others. First of all, if unity is desired, it becomes necessary to seek an orderly construction of lines and masses. By feeling about with the pencil, such lines may begin to appear. It may require changes; it certainly will demand patience and possibly several fresh starts, for an idea on paper is worth a dozen ideas unrecorded. As the lines begin to cross or come into contact with one another, areas are formed. The measure and shape of each of these areas must be carefully watched. Each area is a spot with a certain amount of attractive force. These attractive forces must be in relations of balance and harmony if the interest is to be properly distributed. Then, having studied the spots as blacks and whites, the question of tone relations assumes importance.

And this is what is meant by thinking in tones,

PLATE CX

PLATE CXI

measures and shapes, quite a different process from "conventionalizing" a flower; a process in which the student often overlooks the principles of composition in his attention to the truth of representation, fearful that he may lose the identity of the specimen with which he started.

In Plate CXII another start is made in a different way, and in Plates CXIII and CXIV an attempt is made to utilize two of the units thus gained in a development over a surface. In these surface repeats

PLATE CXIII

PLATE CXIV

the adjustment of blacks and whites demanded various alterations in the units. To make a unit and merely repeat it over a surface would have been a stupid proceeding. In Plate CXIV we have gone back to purely abstract lines and areas; there is scarcely a suggestion here that would lead one to suspect a development from the little weed in Plate CX. It is entirely immaterial that there should be any apparent relation between the two. A design must stand or fall on its own merits.

In Plate CXV another idea finds expression — suggesting in its turn Plate CXVI.

In Plate CXVII several interpretations of the same idea are shown, changes being necessary in each case in order that the unit may harmonize with the space to be filled. In the last example (Plate CXVIII) the unit readily adapted itself to its position without change.

The experiment might continue indefinitely; but it is enough to show something of the extensive field the designer may choose in his selection of a motif, from nature on the one hand to abstract lines and areas on the other.

Much still remains to be said on the subject of design. In fact, during the course of this work little more than a few suggestions in the way of structural anatomy have been presented. It has seemed best to keep to the simplest possible demonstrations of fundamental principles, a subject that has received too little attention from would-be designers.

As a brief summary of the work, we may say that designs must be dependent for beauty upon the relation of tones, measures and shapes when consid-

PLATE CXV

PLATE CXVI

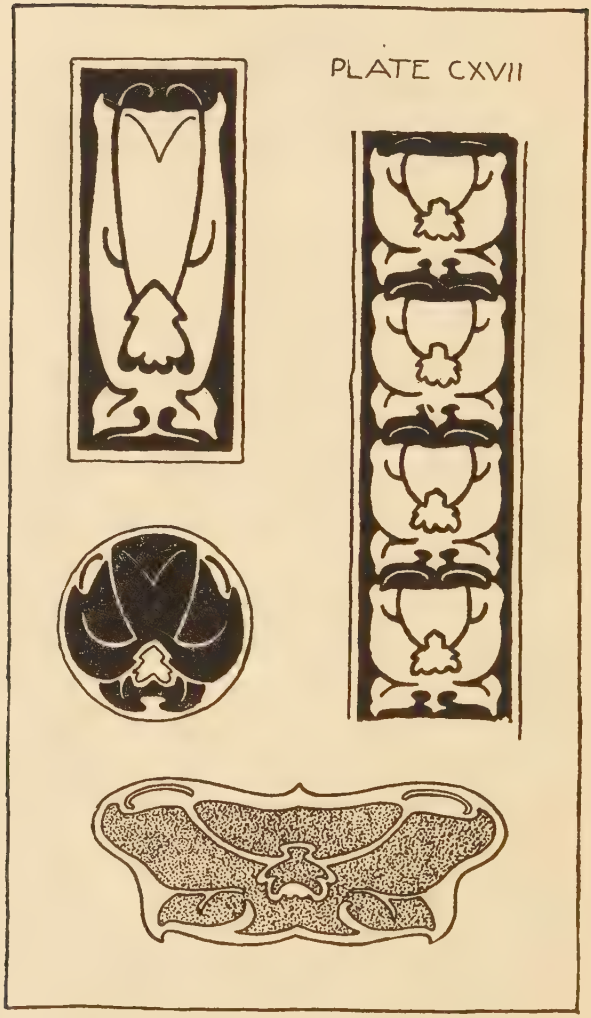
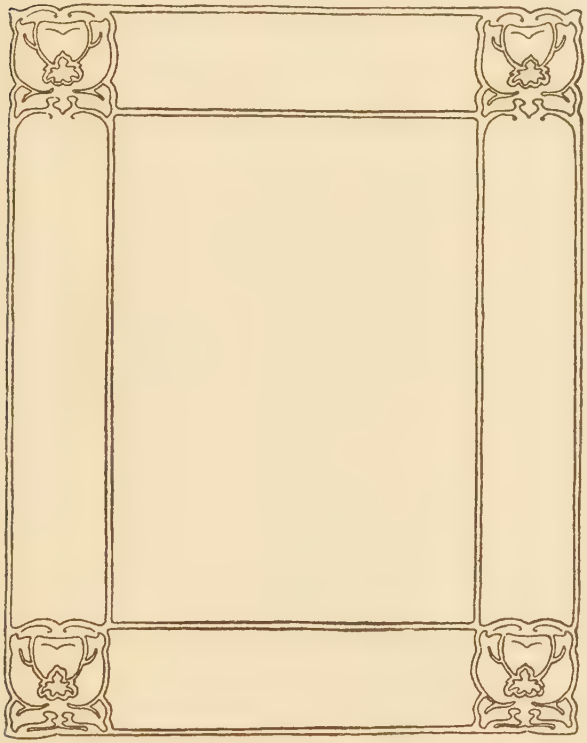


PLATE CXVII

ered as lines and as areas. The principles of design we recognize as three in number — rhythm, balance and harmony. Hence, the problem that confronts the student of design is to bring tones, measures

PLATE CXVIII



and shapes into relations of rhythm, balance and harmony. Each principle manifests itself in a variety of ways. Rhythm may appear as shape rhythm, measure rhythm, tone rhythm. With a clear idea of

these various types of movement, the designer finds it possible to regulate the action or rhythm in his work, to lead the eye wherever he may choose, to concentrate the interest at one point or to distribute the interest as he may wish. But joint movement should always be associated with a feeling of repose or balance. Here, again, we may resort to several types of balance: shape balance, measure balance, tone balance. And with these qualities comes the additional question of harmony, which, again, may be derived by means of shape harmony, measure harmony, tone harmony.

These are some of the important things to understand as a first step. If you would know something about designing, and care to dig below the surface of the subject, it would be well at the start to concentrate attention upon these fundamental principles. Nothing worth while can be gained without conscientious study. But there will be little of interest here for the man whose only aim is to produce work just good enough to sell, to whom ideals, study, principles, are things to be smiled at; who is searching for novelties that will please, and is in pursuit of every fitful fad and fashion.

Whatever you do, think for yourself; express yourself simply and directly. Do not be a man of "tissue-paper ideas." Study all the good things to be found, but do not allow them to induce an effort at imitation. Study carefully the historic development of design. A knowledge of the various historic styles is very important, and should be helpful to us all. But we should bear in mind that such knowledge, no matter how profound, does not necessarily

imply an artistic appreciation of good work. There is no merit in any particular type of work; Greek designs are no more worthy than Chinese designs. They must all be brought to the test of fundamental principles, and, lacking an understanding of these principles, we have no criterion other than our personal likes or dislikes by which a judgment may be formed.

These principles of design it has been the aim of this book to define. The term design has been limited, intentionally, to its most elementary application — spots of paint on paper. It is left for the student himself to apply the principles to such work as he may be called upon to perform.

And, last of all, if you would make of your work an art, rather than a trade, remember that there is no such thing as proficiency in art. The artist is always alive to the need of continued study and persistent work.

Mergenthaler Linotype Composition